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ST. LOUIS, MISSOURI, U.S.A.

CATALOGUE

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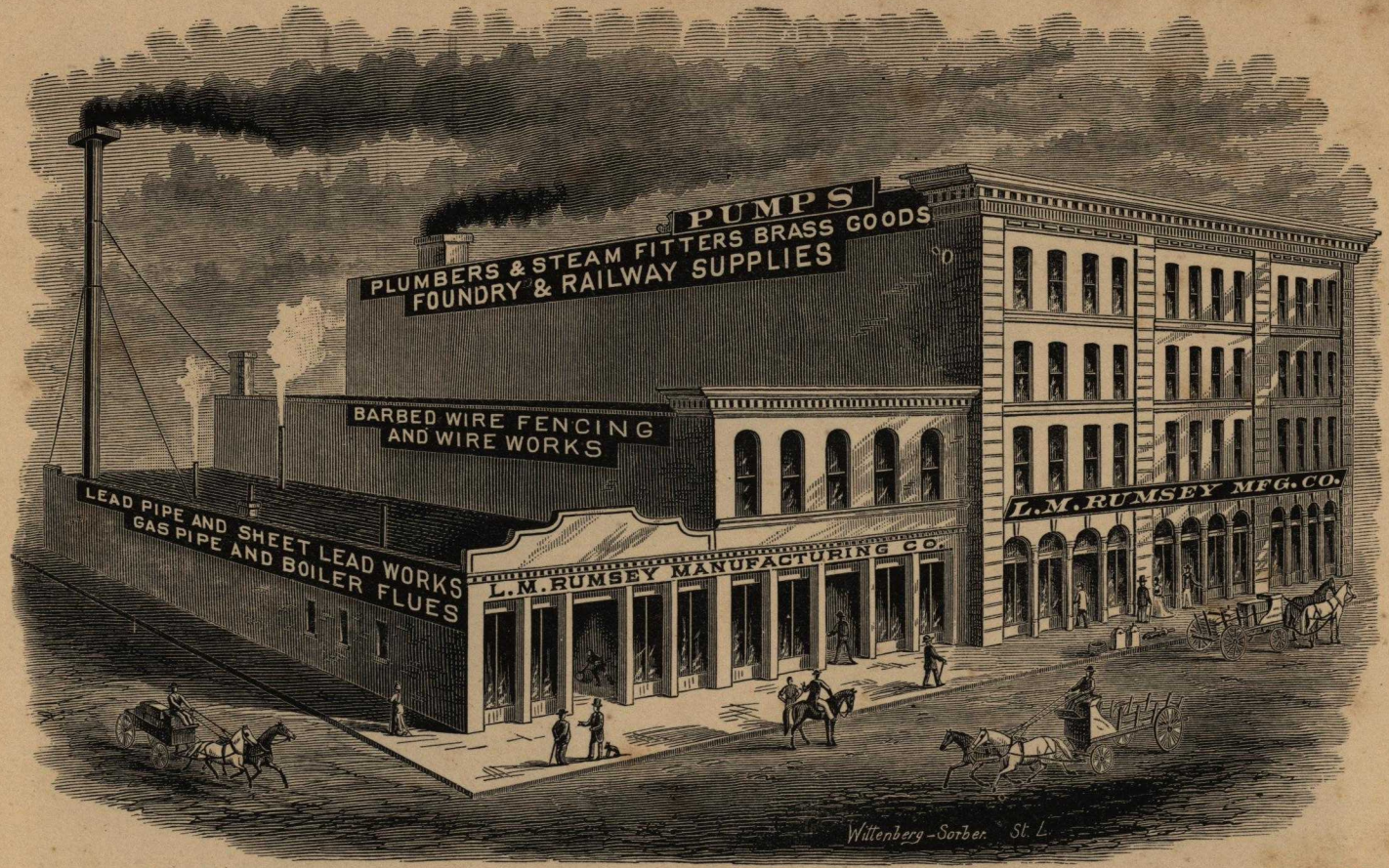

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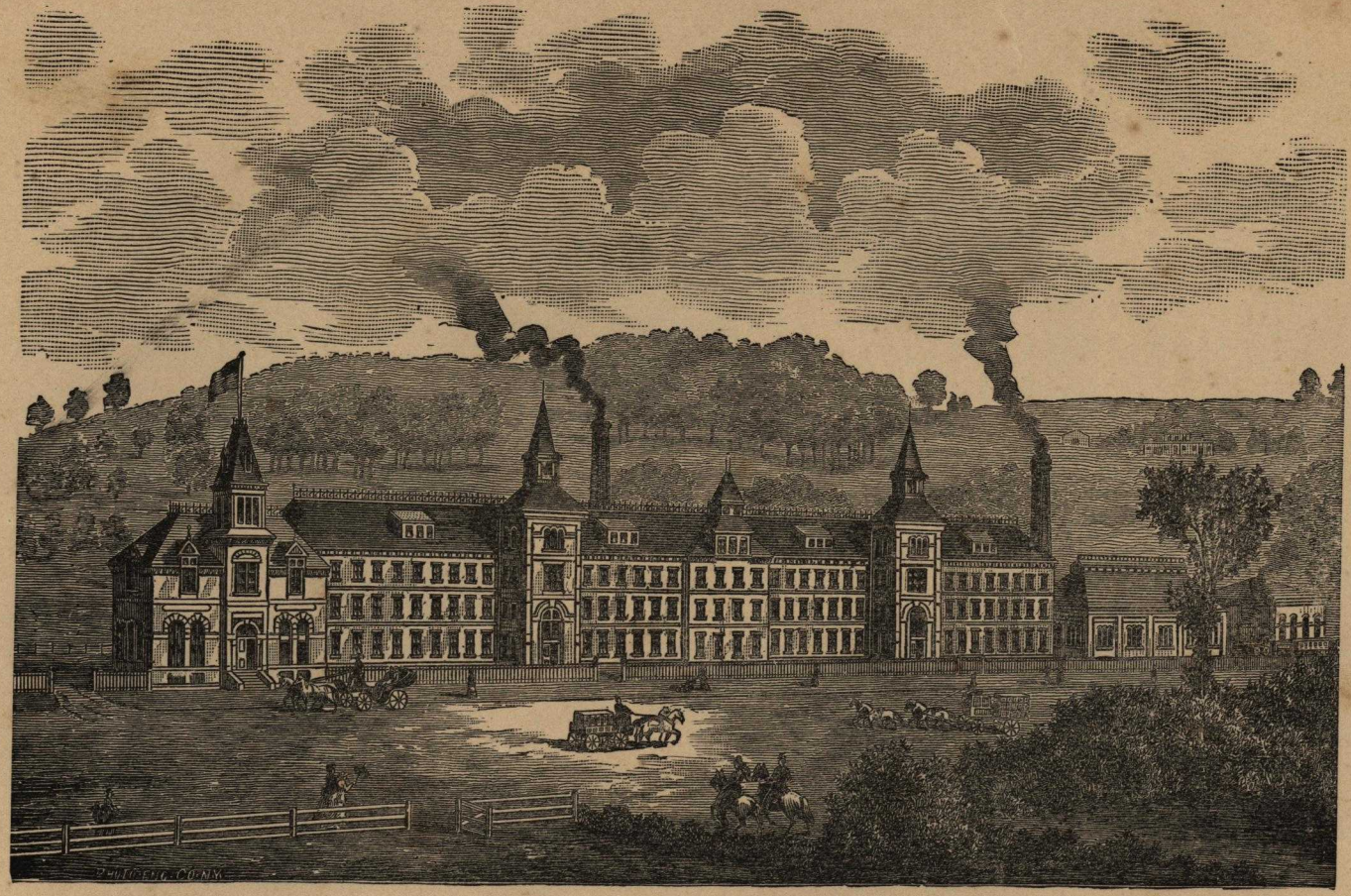
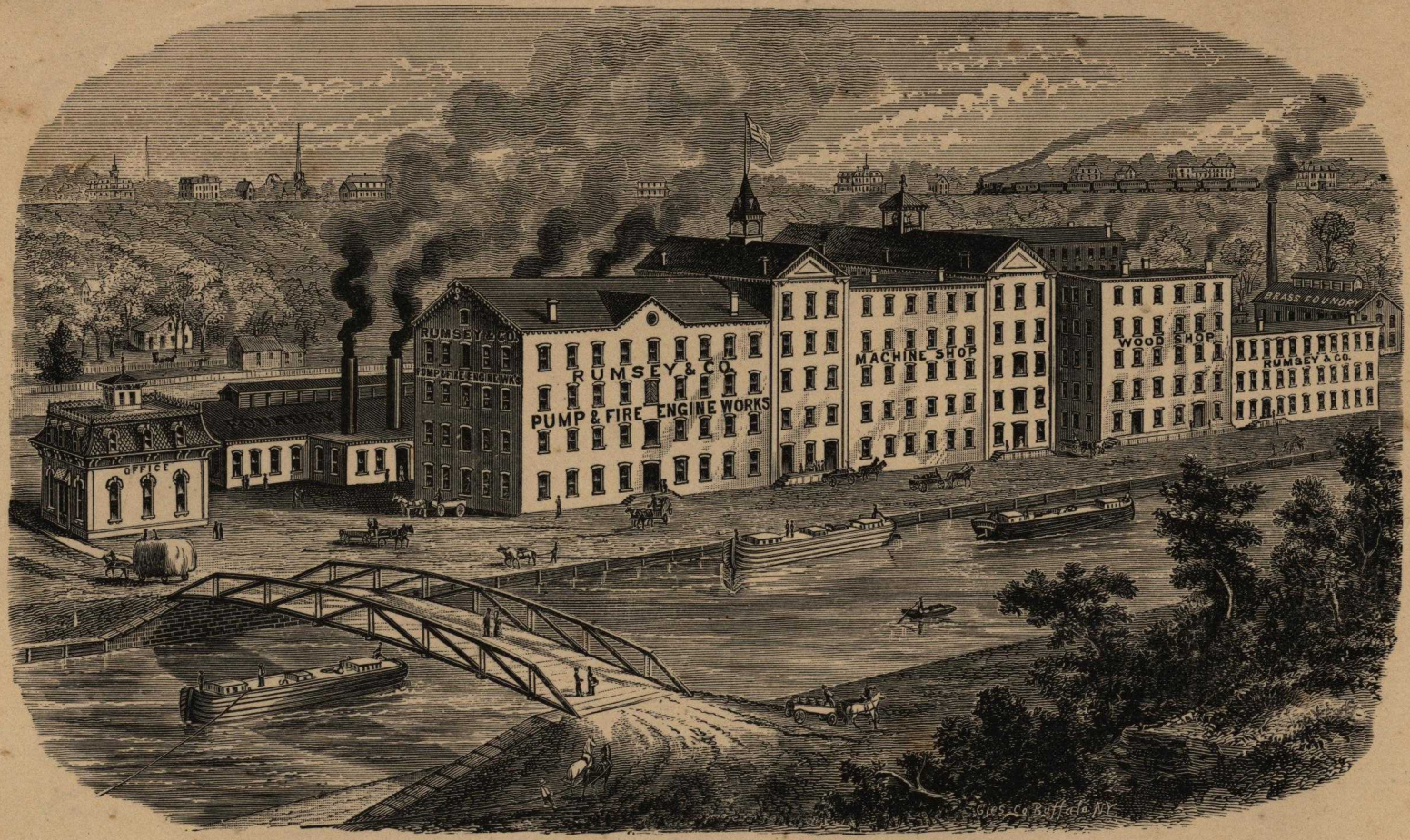


PLUMBERS' AND STEAM FITTERS' BRASS AND IRON WORK FACTORY.



PUMP AND FIRE ENGINE WORKS.

L. M. RUMSEY, *PRES'T.* | A. M. WOOD, *TREAS.* | M. RUMSEY, *SEC'Y.*

L. M. RUMSEY MFG. CO.'S

ILLUSTRATED CATALOGUE

OF

PLUMBERS', GAS & STEAM FITTERS', MACHINISTS', ENGINE BUILDERS' AND

RAILROAD SUPPLIES,

——CONSISTING OF——

BRASS GOODS

FOR

PLUMBERS, STEAM FITTERS AND ENGINE BUILDERS;

Plumbers' Iron, Copper and Earthenware Goods, Lead, Sewer and Gas Pipe, Sheet Lead;

TOOLS FOR PLUMBERS, STEAM & GAS FITTERS & MACHINISTS;

OUTFIT FOR RAILROAD CONSTRUCTION AND MINING;

BARBED WIRE FENCING AND FENCE WIRE, WIRE ROPE,

BELTING, HOSE AND PACKING,

IRON AND WOOD-WORKING MACHINERY,

ENGINES AND BOILERS;

PUMPS,

IRON AND WOOD, LIFT AND FORCE, HAND, POWER AND STEAM,

FIRE ENGINES, ETC., ETC.

ST. LOUIS:

RIVERSIDE PRINTING HOUSE, 300 AND 302 NORTH MAIN STREET.

OFFICE OF

L. M. RUMSEY MANUFACTURING CO.,

ST. LOUIS, MO., U. S. A.

TO THE TRADE.

In the following pages we take pleasure in presenting you our New and Fully Revised

ILLUSTRATED CATALOGUE AND PRICE LIST,

comprising a very complete and extensive assortment of the goods mentioned on its title page, together with many other articles of our manufacture too numerous to mention here in detail.

In this edition of our Catalogue we have added many new features, covering all that is recent and desirable in our line of manufacture. We shall keep on hand a stock so complete that our customers may rely upon their orders being satisfactorily filled without delay, and at lowest market rates from first hands.

Discount Sheets, and Supplements of New Goods, and Prices, will be issued as circumstances require, and our patrons will, in all cases, receive the benefit of any change or reduction, in accordance with that spirit of liberality which has ever characterized the dealings of our house.

Grateful for patronage in the past, and soliciting future favors, we are,

Very truly yours,

L. M. RUMSEY MFG. CO.

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NOTICE.

WE CALL SPECIAL ATTENTION TO THE FOLLOWING

CHANGES AND CORRECTIONS

IN LISTS.

Page 40 to 45, inclusive, FULLER'S BRASS WORK, New List.

Page 255, MAGIC SCREW PLATE, for Pipe.
Change list to read as follows: No. 1, $20.00; No. 2, $22.00; No. 3, $28.00; No. 4, $50.00; No. 5, $65.00.

Page 354, MAGIC SCREW PLATE, for Blacksmiths' and Carriage Makers' use.
Change list to read as follows: Size A, $20.00; Size B, 27.50; No. 2, $50.00.

MAGIC SCREW PLATE, for Machinists' use.
Change list to read as follows: Size A, $23.00; Size B, $33.00.

Page 390, HAND SHAPING MACHINE, without legs.
Change list to read as follows: - - - - - - $110.00.

HAND SHAPING MACHINE, with legs.
Change list to read as follows: - - - - - - $120.00.

POWER SHAPING MACHINE, with Counter-shaft.
Change list to read as follows: - - - - - - $135.00.

Page 435 to 439, inclusive, PHOENIX ENGINES AND BOILERS, New List.

Page 451 to 454, inclusive, ALL BLOCKS, New List.

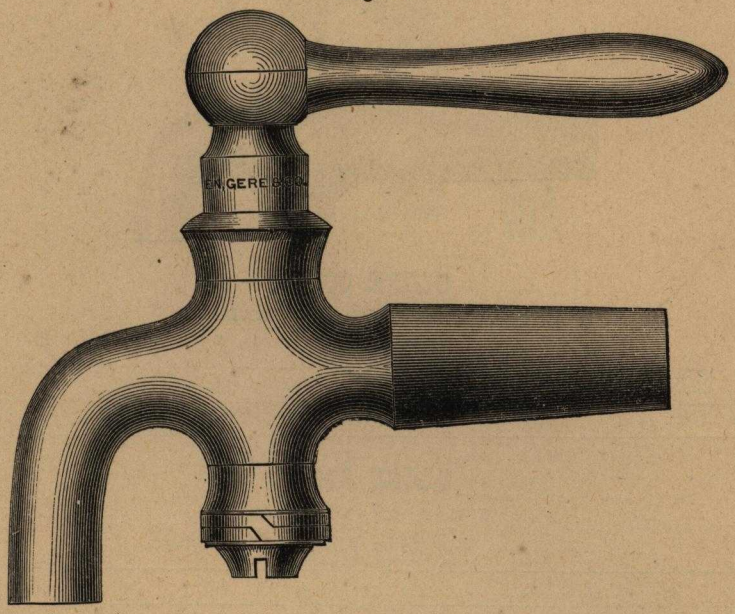
Page 259, POWER PIPE MACHINES, New List.

On account of constantly occurring revisions and changes, it is impossible to make permanent list prices on many goods of our manufacture, or which we control. For this reason we have omitted lists on many things in the following Catalogue, but have to say to our customers that we can make prices as low as the lowest, and believe that their interests will be served by corresponding with us before making purchases elsewhere.

HARDWARE BRASS WORK.

PLAIN BIBBS.

Fig. 2.



PLAIN BIBBS.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Rough, Fig. 1, per doz	$ 8 00	10 00	13 00	16 00	21 00	32 00	46 00	72 00	120 00	150 00
Finished, Fig. 2, per doz	9 00	11 00	14 50	18 00	24 00	36 00	54 00	84 00	130 00	170 00
Nickel-Plated, Fig. 2, per doz	11 00	13 00	17 00	20 50	26 50	39 00				
Silver-Plated, Fig. 2, per doz	16 00	18 50	23 50	30 00	39 00	62 00				

FINISHED PLAIN BIBBS,

LONG SHANK.

Fig. 19.

Size	¼	⅜	½	⅝	¾	1 in.
Per doz	$13 00	17 00	22 00	27 00	36 00	50 00
Nickel-Plated, ℔ doz.	15 00	20 00	25 50	30 50	40 00	55 00
Silver-Plated, ℔ doz	21 00	26 00	32 00	39 00	51 00	70 00

FINISHED PLAIN BIBBS,

LONG SHANK, SCREWED FOR WOOD.

Fig. 20.

Size	¼	⅜	½	⅝	¾	1 in.
Per doz	$15 00	19 00	24 00	29 00	39 00	53 00
Nickel-Plated, ℔ doz.	17 00	22 00	27 50	32 50	43 00	58 00
Silver-Plated, ℔ doz.	23 00	28 00	34 00	41 00	54 00	73 00

ROUGH PLAIN BIBBS,

SCREWED FOR WOOD.

Fig. 17.

Size	¼	⅜	½	⅝	¾	1 in.
Per doz	$ 9 00	11 50	15 00	18 00	24 00	37 00
Size	1¼	1½	1¾	2		
Per doz	54 00	82 00	135 00	175 00		

FINISHED PLAIN BIBBS,

SCREWED FOR WOOD.

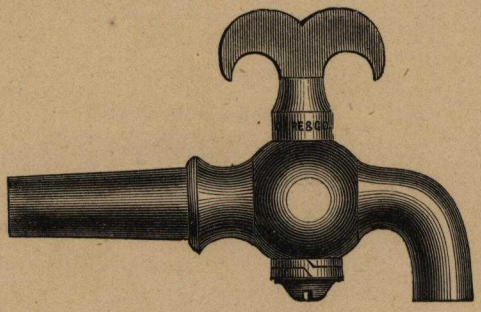
Fig. 18.

Size	¼	⅜	½	⅝	¾	1 in.
Per doz	$10 00	12 50	16 50	20 00	27 00	41 00
Size	1¼	1½	1¾	2		
Per doz	62 00	94 00	145 00	195 00		
Size	¼	⅜	½	⅝	¾	1
Nickel-Plated, ℔ doz.	12 00	14 50	19 00	22 50	29 50	44 00
Silver-Plated, ℔ doz.	17 00	21 00	25 50	32 00	42 00	67 00

GLOBE COCKS,

T HANDLE, TINNED END.

Fig. 150.



GLOBE COCKS,

T HANDLE, TINNED END.

Fig. 150.

Size	¼	⅜	½	⅝	¾	1 in.
Finished, per doz	$ 8 00	10 00	13 50	16 00	22 00	33 00

GLOBE COCKS,

T HANDLE, TO SCREW.

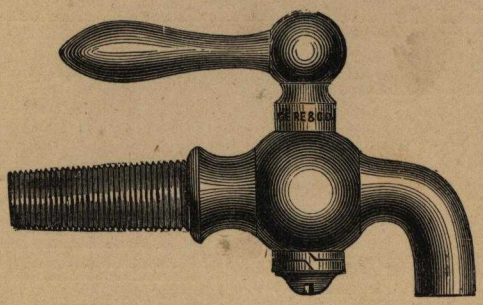
Fig. 151.

Size	¼	⅜	½	⅝	¾	1 in.
Finished, per doz	$ 8 50	10 75	14 50	17 50	24 00	35 50

GLOBE COCKS,

LEVER HANDLE, TO SCREW.

Fig. 153.



GLOBE COCKS,

LEVER HANDLE, TINNED END.

Fig. 152.

Size	¼	⅜	½	⅝	¾	1 in.
Finished, per doz	$ 9 00	11 00	14 50	18 00	24 00	33 00

GLOBE COCKS,

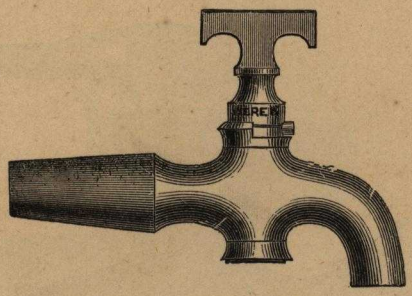
LEVER HANDLE, TO SCREW.

Fig. 153.

Size	¼	⅜	½	⅝	¾	1 in.
Finished, per doz	$ 9 50	11 75	15 50	19 50	26 00	38 50

BOILER COCKS.

Fig. 134.



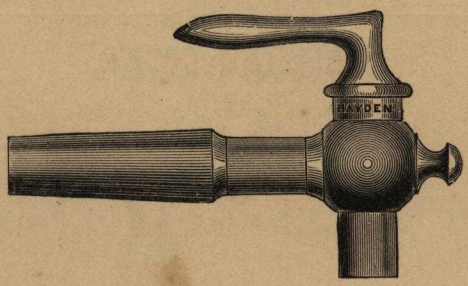
BOILER COCKS.

Fig. 134.

Size	¼	⅜	½	⅝	¾	⅞	1 in.
Finished, per doz	$6 00	7 00	8 50	9 50	15 00	19 00	27 00

COOLER COCKS.

Fig. 137.



BIBB COOLER COCKS.

Fig. 136.

Size	¼	⅜	½	⅝
Finished, per doz	$ 8 00	9 00	10 50	14 00
Nickel-Plated, per doz	9 50	10 50	12 00	16 00
Silver-Plated, per doz	11 50	12 50	14 00	19 00

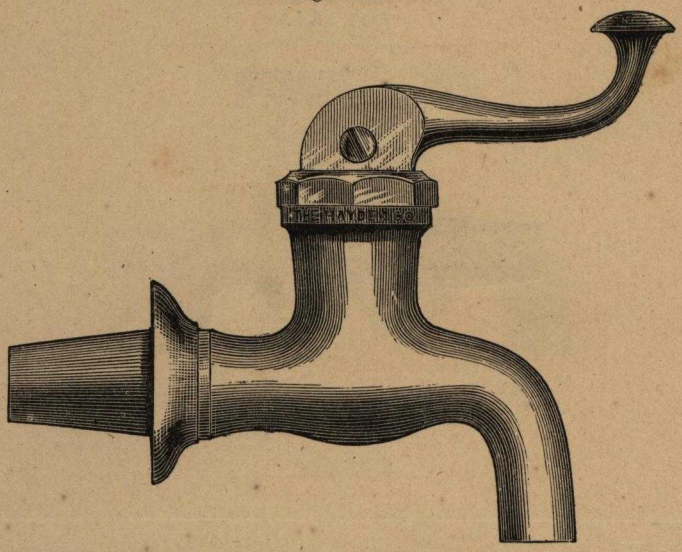
COOLER COCKS.

Fig. 137.

Size	¼	⅜	½	⅝
Finished, per doz	$5 00	5 50	7 00	9 00
Nickel-Plated, per doz	6 00	6 50	8 00	11 00
Silver-Plated, per doz	8 00	8 50	11 00	14 00

TELEGRAPH COOLER COCKS.

Fig. 303.



FINISHED TELEGRAPH COOLER COCKS.

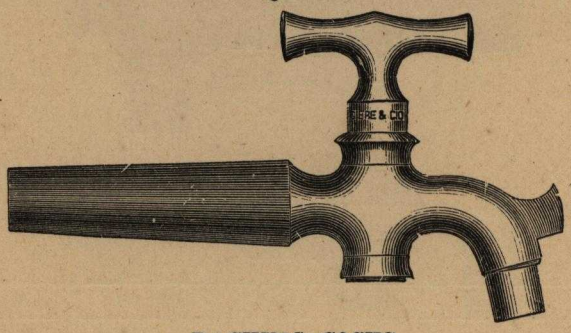
Fig. 303.

Size	⅜	½	⅝	¾ in.
Per doz	$ 16 00	18 00	21 00	26 00
Nickel-Plated, per doz	18 00	20 50	23 50	28 50
Silver-Plated, per doz	23 50	27 00	33 00	44 00

RACKING COCKS,

TO DRIVE.

Fig. 143.



RACKING COCKS,

TO DRIVE.

Fig. 143.

Size	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛	1¼	1½
Finished, per doz	$ 5 00	6 00	7 50	9 00	10 00	12 50	14 50	17 00	23 00	30 00	41 00	54 00	72 00

RACKING COCKS,

TO SCREW.

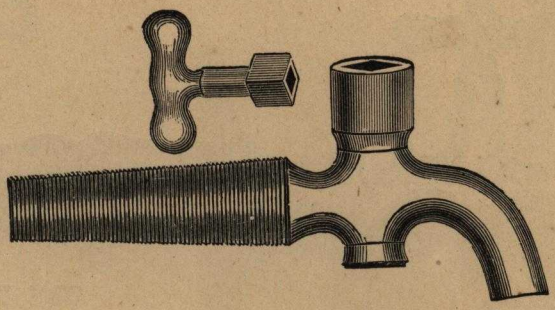
Fig. 144.

Size	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛	1¼	1½
Finished, per doz	$ 5 50	6 50	8 50	10 00	11 00	14 00	16 00	19 00	25 00	32 50	44 00	38 00	77 00

LOCK COCKS,

TO SCREW, ENGLISH PATTERN.

Fig. 147.



LOCK COCKS,

TO DRIVE, NEW PATTERN.

Fig. 148.

Size	⅜	7-16	½	⅝	¾	1
Finished, per doz	$10 00	12 00	14 00	20 00	24 00	40 00

LOCK COCKS,

TO SCREW, NEW PATTERN.

Fig. 149.

Size	⅜	7-16	½	⅝	¾	1
Finished, per doz	$10 50	13 00	15 00	21 50	26 00	42 50

LOCK COCKS,

TO DRIVE, ENGLISH PATTERN.

Fig. 146.

Size	¼	5-16	⅜	7-16	½	⅝	¾	1
Finished, per doz	$6 50	7 50	8 50	10 00	12 00	16 50	20 00	35 00

LOCK COCKS,

TO SCREW, ENGLISH PATTERN.

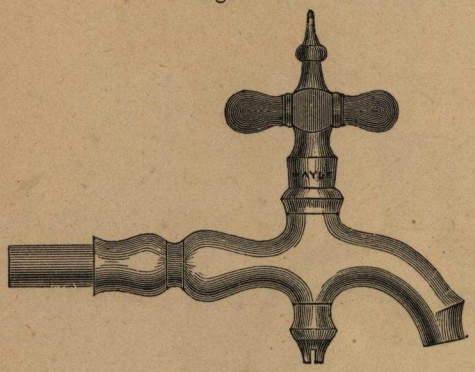
Fig. 147.

Size	¼	5-16	⅜	7-16	½	⅝	¾	1
Finished, per doz	$7 00	8 00	9 00	11 00	13 00	18 00	22 00	37 50

URN COCKS,

RUBBER T HANDLE.

Fig. 141.



URN COCKS,

RUBBER T HANDLE.

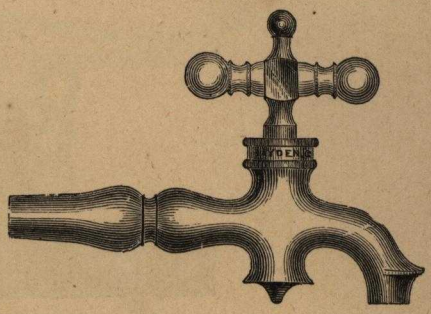
Fig. 141.

Size	3-16	¼	5-16	⅜	7-16	½ in.
Finished, per doz	$11 00	12 00	13 00	14 00	16 00	20 00
Nickel-Plated, ℔ doz.	13 00	14 00	15 00	16 00	18 00	22 00
Silver-Plated, ℔ doz.	15 00	16 00	17 00	18 00	20 00	24 00

URN COCKS,

IVORY T HANDLE.

Fig. 142.



URN COCKS,

IVORY T HANDLE—PATENTED.

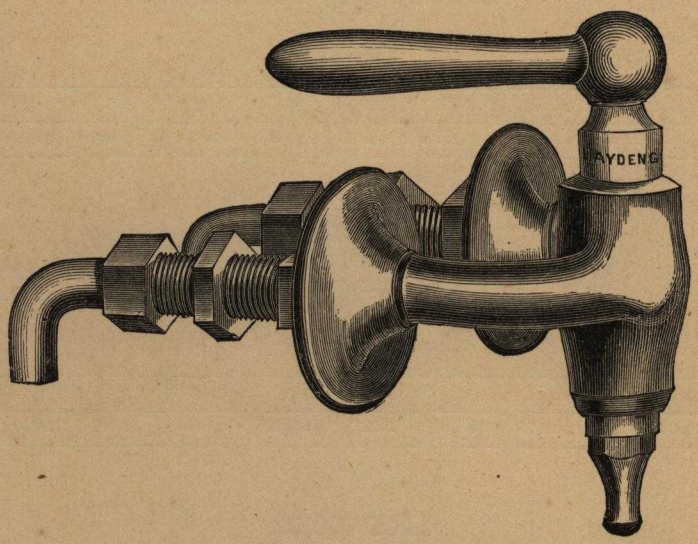
Fig. 142.

Size	¼	⅜	7-16	½	9-16
Finished, per doz	$14 00	15 00	17 00	25 00	28 00
Nickel-Plated, per doz	16 00	17 00	19 00	27 00	30 00
Silver-Plated, per doz	18 00	19 00	21 00	30 00	32 00

BAR COCKS,

TWO WAY.

Fig. 133.



BAR COCKS,

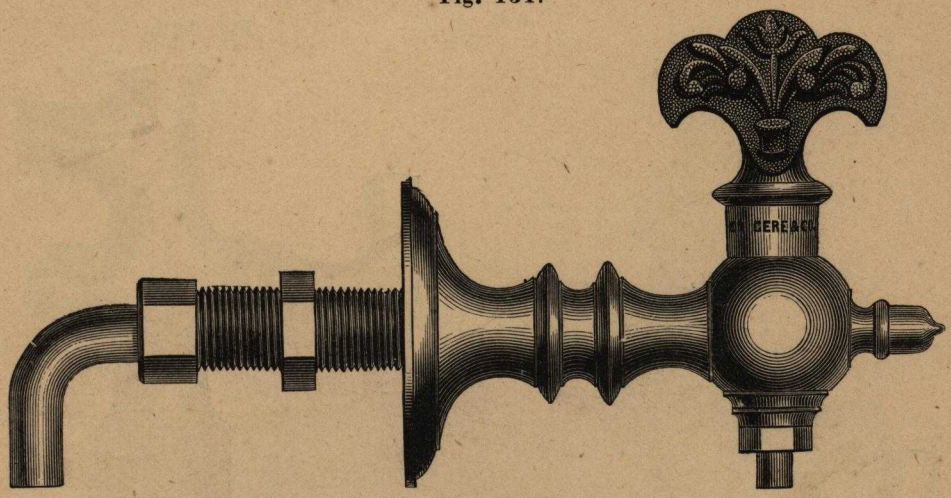
TWO WAY.

Fig. 133.

Finished, per doz	$ 60 00
Nickel-Plated, per doz	68 00
Silver-Plated, per doz	80 00

BAR COCKS, No. 1.

Fig. 131.



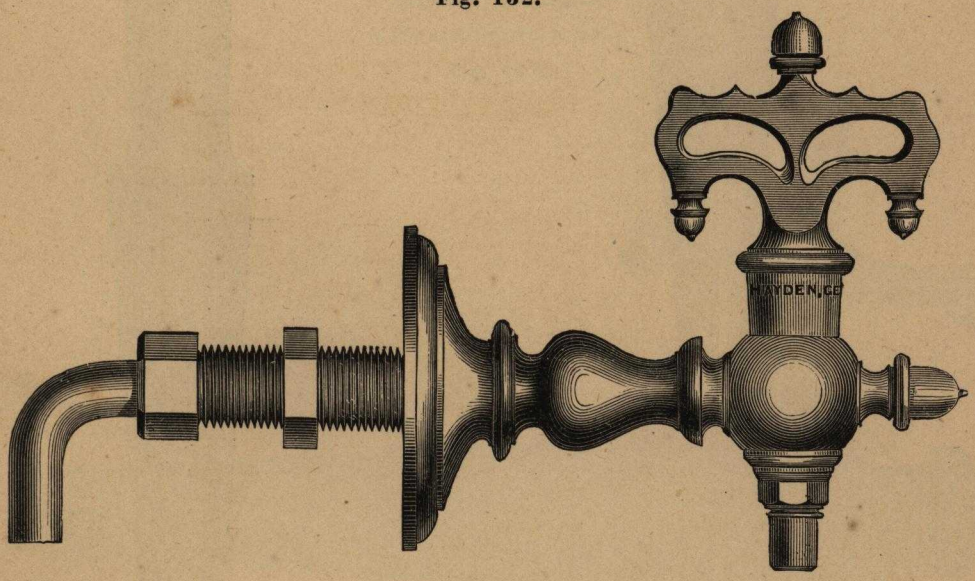
BAR COCKS, No. 1.

Fig. 131.

Finished, per doz	$ 36 00
Nickel-Plated, per doz	42 00
Silver-Plated, per doz	54 00

BAR COCKS, No. 2.

Fig. 132.



BAR COCKS, No. 2.

Fig. 132.

Finished, per doz	$44 00
Nickel-Plated, per doz	50 00
Silver-Plated, per doz	62 00

LAGER BEER COOLER COCKS.

Fig. 122.

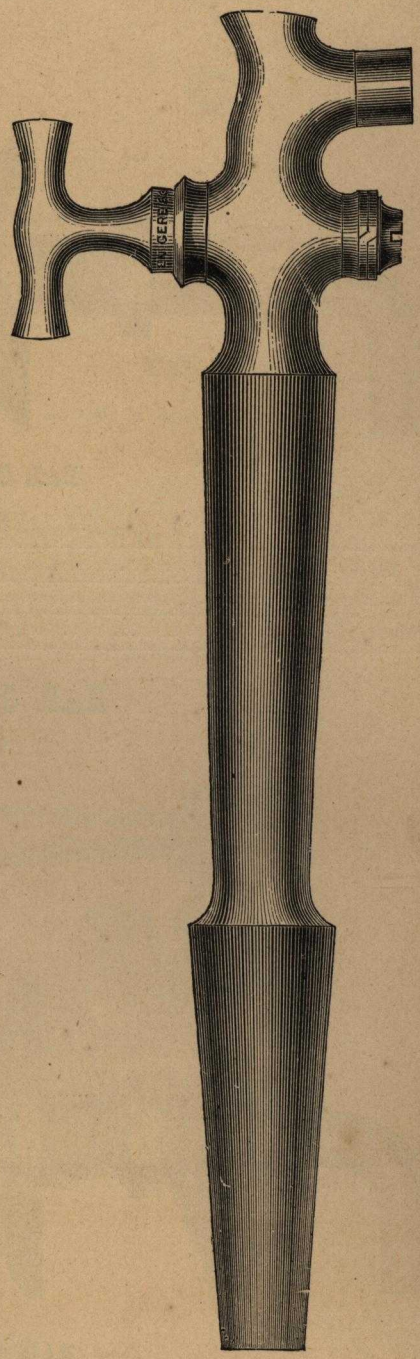
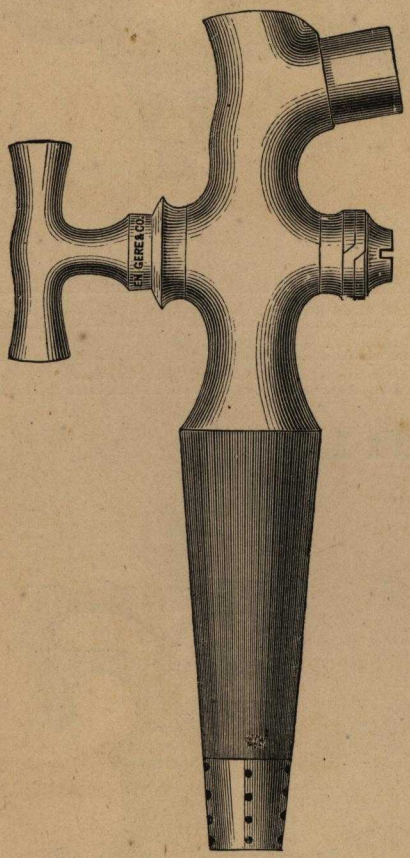


Fig. 122.



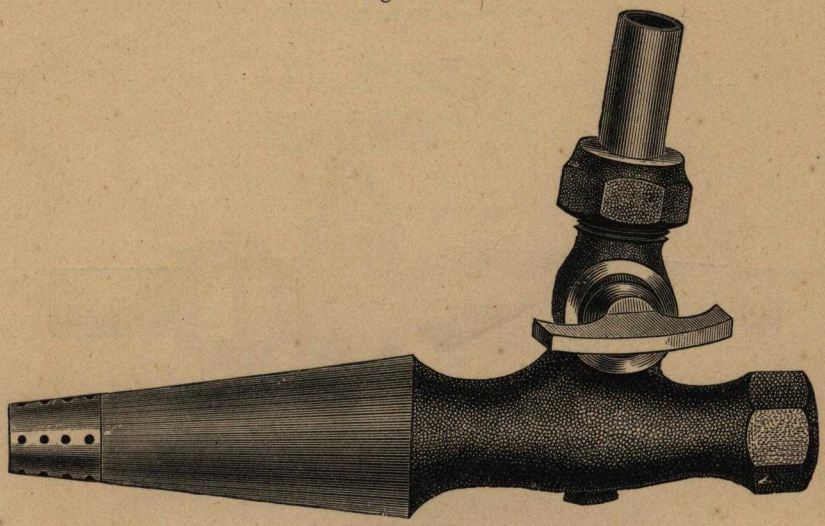
FINISHED.

Length	10	12	14	16	18	20	22 in.
Per doz.	$24 00	30 00	32 00	36 00	40 00	44 00	48 00

BEER COCKS,

WITH COUPLING ON TOP.

Fig. 110.



BEER COCKS,

WITH COUPLING ON TOP.

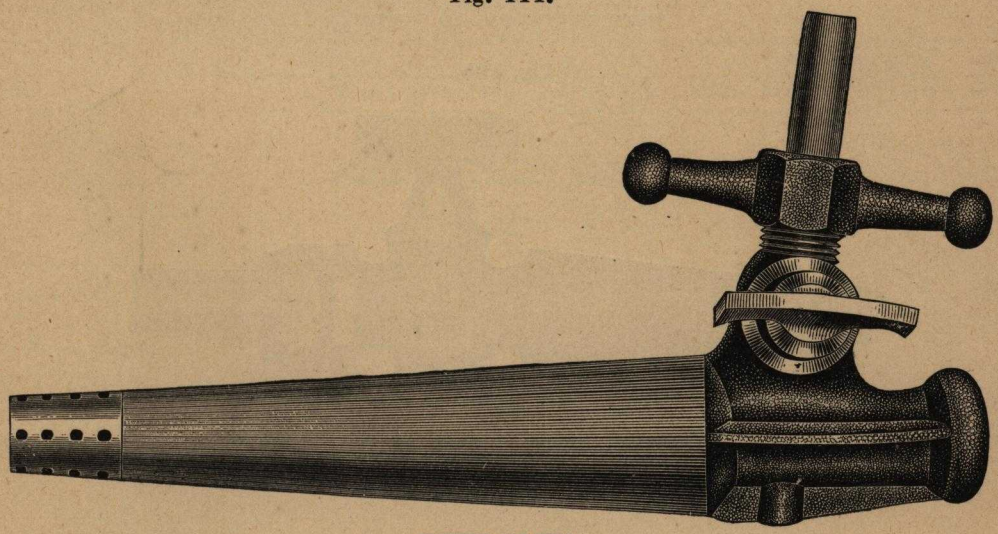
Fig. 110.

Size	⅝ in.
Per doz	$24 00

BEER COCKS.

WITH COUPLING ON TOP.

Fig. 111.



BEER COCKS,

WITH COUPLING ON TOP.

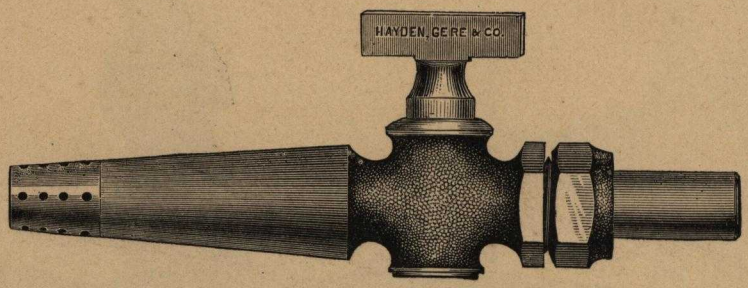
Fig. 111.

Size	⅝ in.
Per doz	$30 00

BEER COCKS,

WITH COUPLING, TO DRIVE.

Fig. 104.



BEER COCKS,

WITH COUPLING, TO DRIVE.

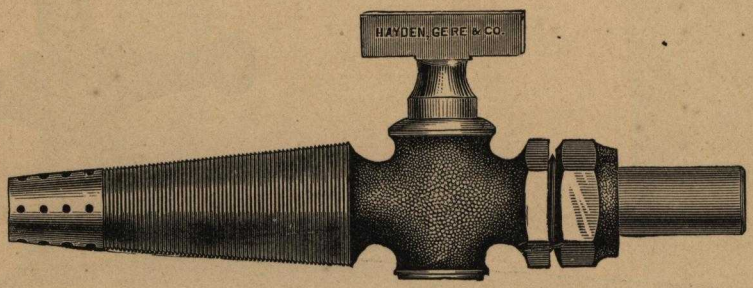
Fig. 104.

Size	½	⅝	¾ in.
Per doz	$ 10 00	12 00	20 00

BEER COCKS.

WITH COUPLING, TO SCREW.

Fig. 105.



BEER COCKS,

WITH COUPLING, TO SCREW.

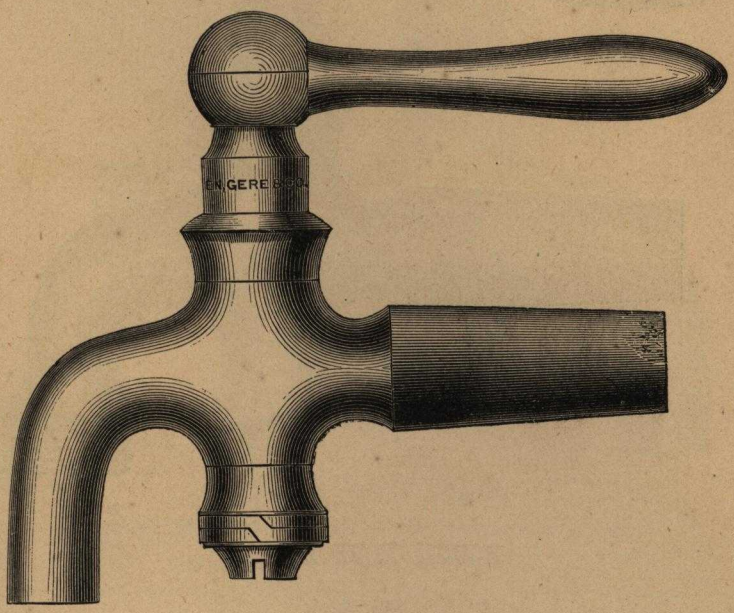
Fig. 105.

Size	½	⅝	¾ in.
Per doz	$ 11 00	13 00	21 00

PLUMBERS' BRASS GOODS.

PLAIN BIBBS.

Fig. 2.



ROUGH PLAIN BIBBS.

Fig. 1.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$8 00	10 00	13 00	16 00	21 00	32 00	46 00	72 00	120 00	150 00

FINISHED PLAIN BIBBS.

Fig. 2.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$ 9 00	11 00	14 50	18 00	24 00	36 00	54 00	84 00	130 00	170 00
Nickel-Plated, per doz	11 00	13 00	17 00	20 50	26 50	39 00				
Silver-Plated, per doz	16 00	18 50	23 50	30 00	39 00	62 00				

FINISHED PLAIN BIBBS,

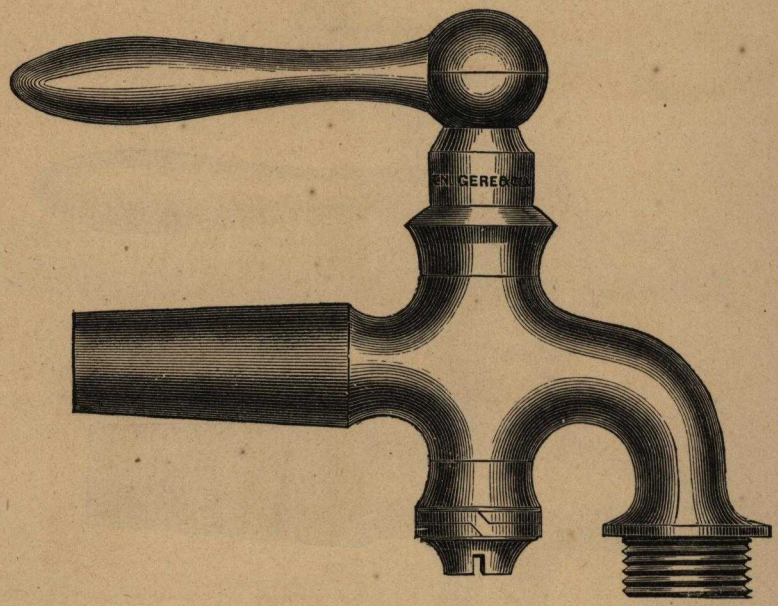
FLANGE AND THIMBLE.

Fig. 13.

Size	⅜	½	⅝	¾	1	1¼ in.
Per doz	$17 00	21 50	26 00	34 00	53 00	76 00
Nickel-Plated, per doz	20 00	25 00	29 50	38 00	57 00	
Silver-Plated, per doz	26 00	32 50	41 00	52 00	81 00	

HOSE BIBBS.

Fig. 4.



ROUGH HOSE BIBBS.

Fig. 3.

Size	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per Doz	$ 11 00	14 00	17 00	23 00	35 00	50 00	78 00	130 00	160 00

FINISHED HOSE BIBBS.

Fig. 4.

Size	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$ 12 00	15 50	19 00	26 00	39 00	58 00	90 00	140 00	180 00
Nickel-Plated, per doz	14 00	18 00	21 50	28 50	42 00				
Silver-Plated, per doz	19 50	24 50	31 00	41 00	65 00				

FINISHED HOSE BIBBS,

FLANGE AND THIMBLE.

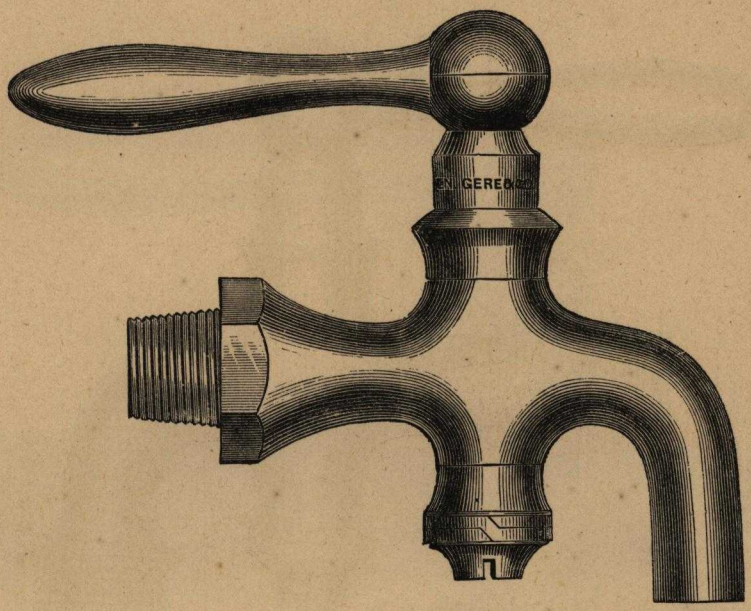
Fig. 14.

Size	⅜	½	⅝	¾	1	1¼ in.
Per doz	$ 18 00	22 50	27 00	36 00	56 00	80 00
Nickel-Plated, per doz	21 00	26 00	30 50	40 00	60 00	
Silver-Plated, per doz	27 00	33 50	42 00	54 00	84 00	

PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 10.



ROUGH PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITHOUT SHOULDER.

Fig. 5.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 00	11 00	14 00	17 00	23 00	35 00	50 00	78 00	160 00

FINISHED PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITHOUT SHOULDER.

Fig. 6.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 10 00	12 00	15 50	19 00	26 00	39 00	58 00	90 00	180 00
Nickel-Plated, per doz	12 00	14 00	18 00	21 50	28 50	42 00			
Silver-Plated, per doz	17 00	19 50	24 50	31 00	41 00	65 00			

ROUGH PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 9.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 00	11 00	14 00	17 00	23 00	35 00	50 00	78 00	160 00

FINISHED PLAIN BIBBS

SCREWED FOR IRON PIPE, WITH SHOULDER.

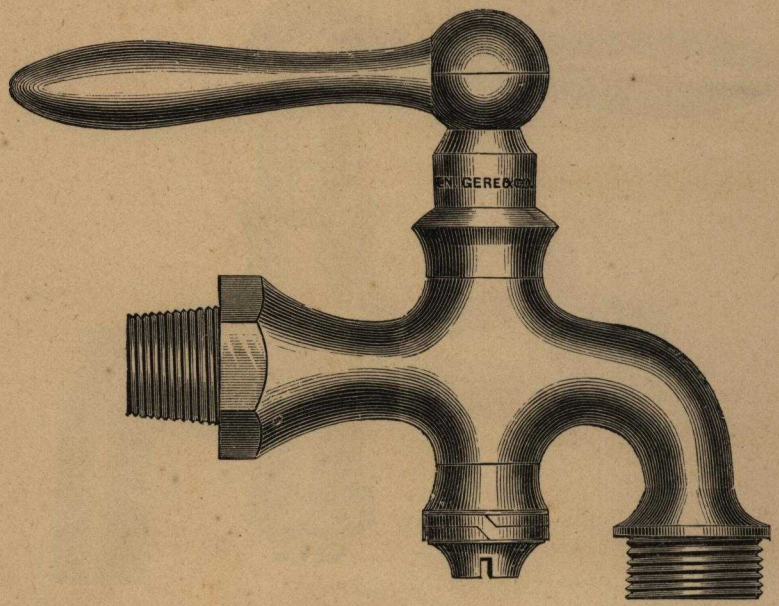
Fig. 10.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 10 00	12 00	15 50	19 00	26 00	39 00	58 00	90 00	180 00
Nickel-Plated, per doz	12 00	14 00	18 00	21 50	28 50	42 00			
Silver-Plated, per doz	17 00	19 50	24 50	31 00	41 00	65 00			

HOSE BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 12.



ROUGH HOSE BIBBS,

SCREWED FOR IRON PIPE, WITHOUT SHOULDER.

Fig. 7.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$12 00	15 00	18 00	25 00	38 00	54 00	84 00	170 00

FINISHED HOSE BIBBS,

SCREWED FOR IRON PIPE, WITHOUT SHOULDER.

Fig. 8.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$13 00	16 50	20 00	28 00	42 00	62 00	96 00	190 00
Nickel-Plated, per doz	15 00	19 00	22 50	30 50	45 00			
Silver-Plated, per doz	20 50	25 50	32 00	43 00	68 00			

ROUGH HOSE BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 11.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$12 00	15 00	18 00	25 00	38 00	54 00	84 00	170 00

FINISHED HOSE BIBBS,

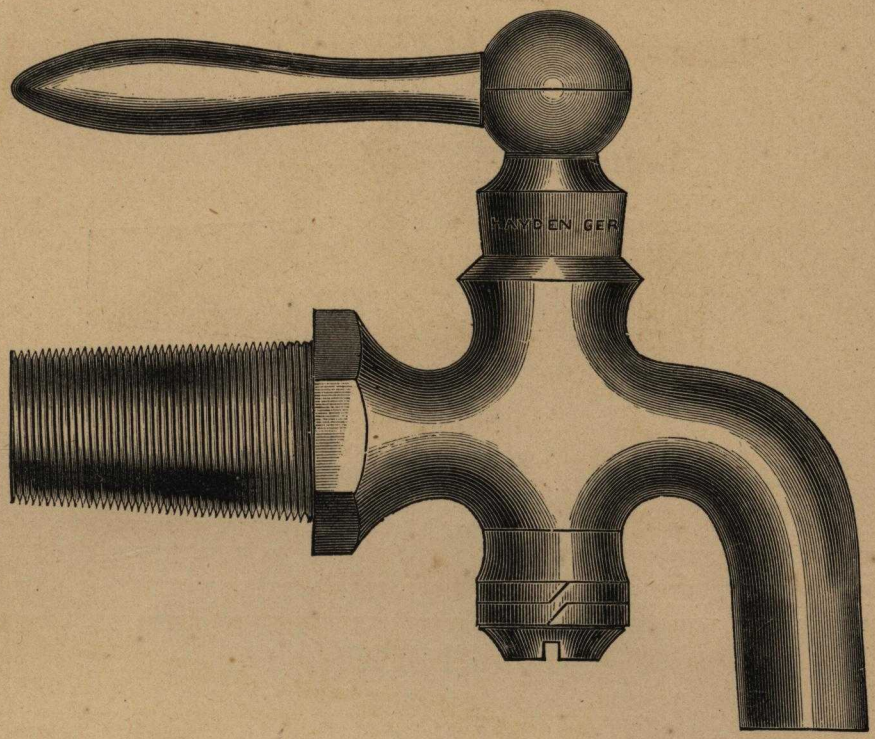
SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 12.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$13 00	16 50	20 00	28 00	42 00	62 00	96 00	190 00
Nickel-Plated, per doz	15 00	19 00	22 50	30 50	45 00			
Silver-Plated, per doz	26 50	25 50	32 50	43 00	68 00			

CISTERN COCKS.

Fig. 24.



ROUGH CISTERN COCKS.

Fig. 23.

Size	½	⅝	¾	1	1¼	1½ in.
Per doz	$18 00	22 00	28 00	40 00	58 00	88 00

ROUGH CISTERN COCKS, With Coupling.

Fig. 22.

Size	½	⅝	¾	1	1¼	1½ in.
Per doz	$20 00	24 00	31 00	44 00	64 00	100 00

FINISHED CISTERN COCKS.

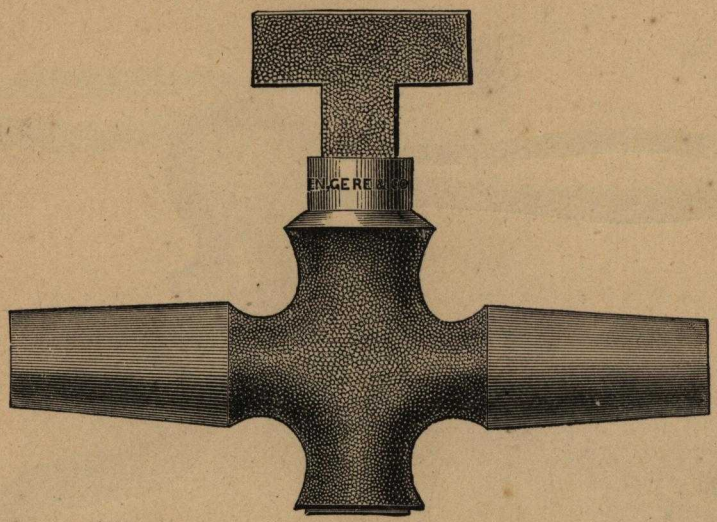
Fig 24.

Size	½	⅝	¾	1	1¼	1½ in.
Finished, per doz	$20 00	24 00	31 00	44 00	64 00	100 00

ROUGH STOPS,

T. HANDLE, RIVET.

Fig. 35.



ROUGH STOPS,

T HANDLE, RIVET.

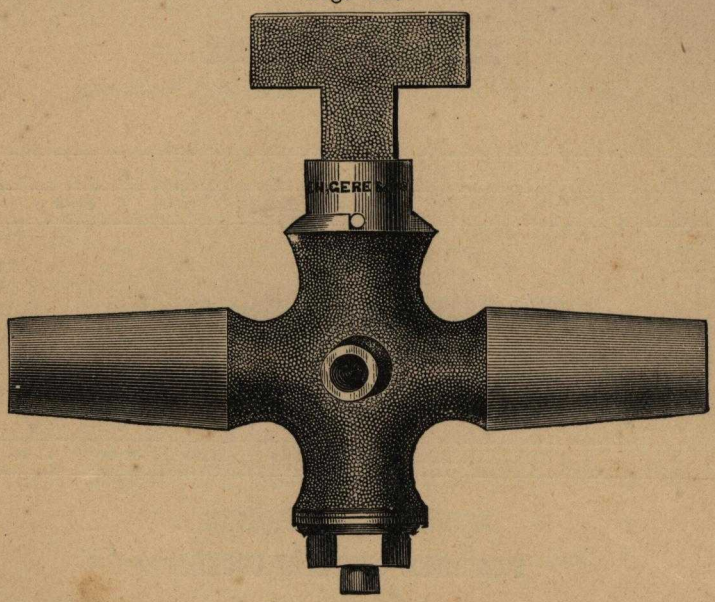
Fig. 35.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$6 00	8 00	10 00	12 00	16 00	24 00	40 00	60 00	100 00

ROUGH STOPS,

T HANDLE RIVET, TUBE WASTE, STOP ON KEY.

Fig. 36.



ROUGH STOPS,

T HANDLE, RIVET, TUBE WASTE, STOP ON KEY.

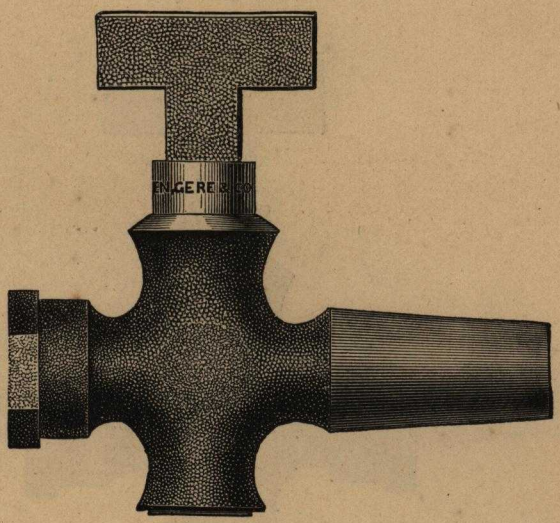
Fig. 36.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 7 00	9 00	11 00	13 00	17 50	26 00	43 00	64 00	110 00

ROUGH STOPS,

T HANDLE, RIVET, FOR LEAD AND IRON PIPE.

Fig. 37.



ROUGH STOPS,

T HANDLE, RIVET, FOR LEAD AND IRON PIPE.

Fig. 37.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 6 50	8 50	10 50	12 50	17 00	25 00	41 50	62 00	105 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, FOR LEAD AND IRON PIPE.

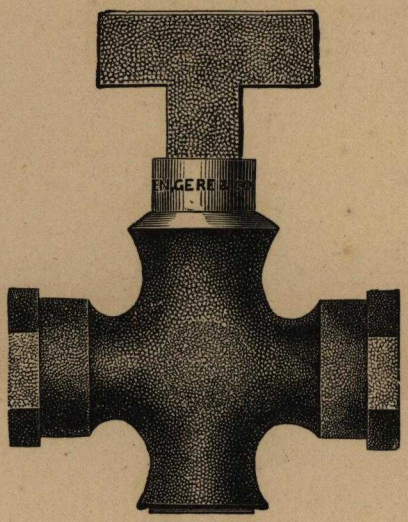
Fig. 43.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 7 50	9 50	11 50	13 50	18 00	27 00	44 50	66 00	115 00

ROUGH STOPS,

T HANDLE, RIVET, SCREWED FOR IRON PIPE.

Fig. 39.



ROUGH STOPS,

T HANDLE, RIVET, SCREWED FOR IRON PIPE.

Fig. 39.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz.	$ 7 00	9 00	11 00	13 00	17 50	26 00	43 00	64 00	110 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, SCREWED FOR IRON PIPE.

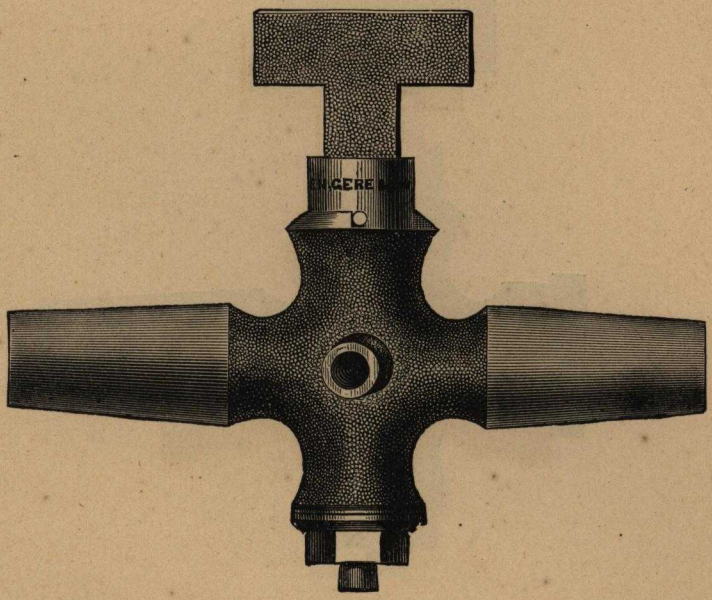
Fig. 45.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, TUB_ WASTE, STOP ON KEY.

Fig. 42.



ROUGH STOPS,

T HANDLE, NUT AND WASHER, TUBE WASTE, STOP ON KEY.

Fig. 42.

Size	¼	⅜	½	⅝	¾	1 in.
Per doz	$8 00	10 00	12 00	14 00	19 00	28 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER.

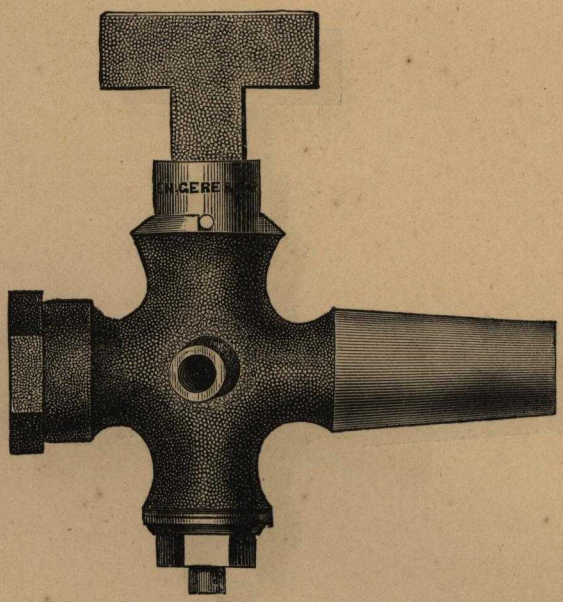
Fig. 41.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$7 00	9 00	11 00	13 00	17 50	26 00	43 00	64 00	110 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, FOR LEAD AND IRON PIPE, TUBE WASTE, STOP ON KEY.

Fig. 44.



ROUGH STOPS,

T HANDLE, RIVET, FOR LEAD AND IRON PIPE, TUBE WASTE, STOP ON KEY.

Fig. 38.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$7 50	9 50	11 50	13 50	18 50	27 00	44 50	66 00	115 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, FOR LEAD AND IRON PIPE, TUBE WASTE, STOP ON KEY.

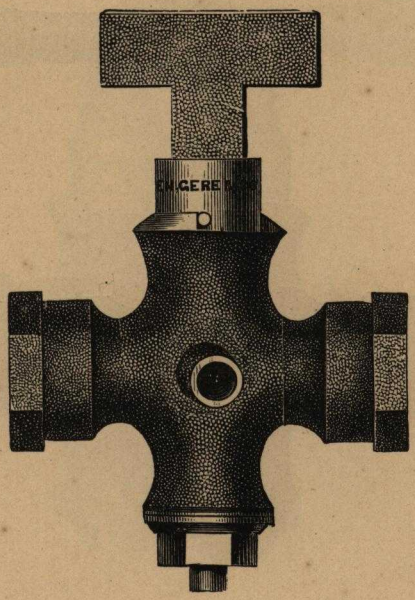
Fig. 44.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$8 50	10 50	12 50	14 50	19 50	29 00	47 50	70 00	125 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

Fig. 46.



ROUGH STOPS,

T HANDLE, RIVET, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

Fig. 40.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

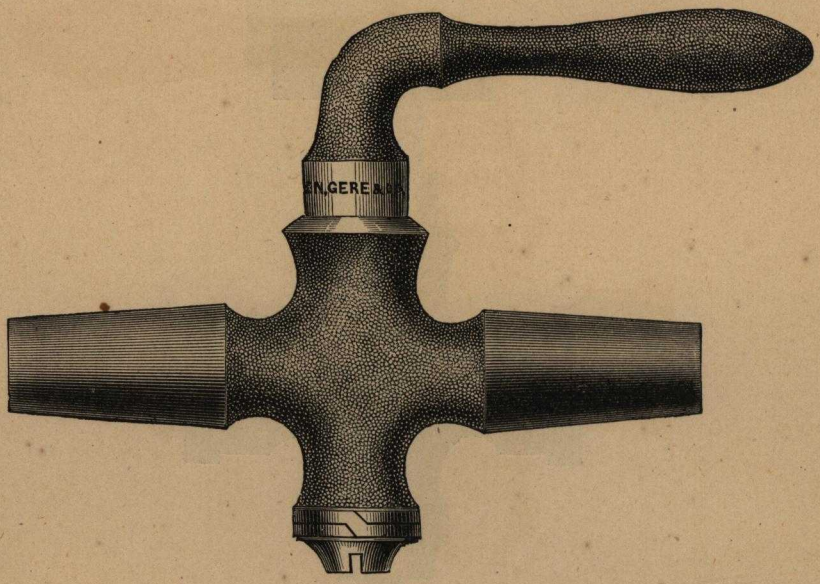
Fig. 46.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 00	11 00	13 00	15 00	20 50	30 00	49 00	72 00	130 00

ROUGH STOPS,

LEVER HANDLE.

Fig. 47.



ROUGH STOPS,

LEVER HANDLE.

Fig. 47.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$7 00	9 00	11 00	13 00	17 50	26 00	43 00	64 00	85 00	110 00

ROUGH STOPS,

LEVER HANDLE, TUBE WASTE, STOP ON KEY.

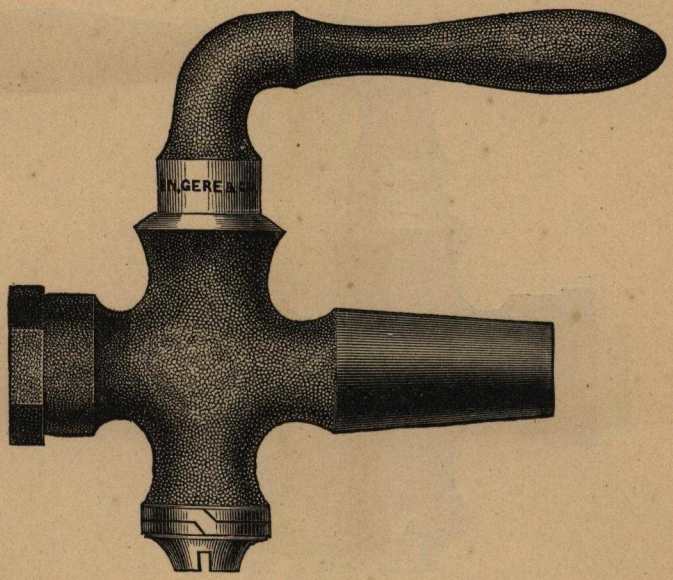
Fig. 48.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$ 8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	93 00	120 00

ROUGH STOPS,

LEVER HANDLE, FOR LEAD AND IRON PIPE.

Fig. 49.



ROUGH STOPS,

LEVER HANDLE, FOR LEAD AND IRON PIPE.

Fig. 49.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 7 50	9 50	11 50	13 50	18 50	27 00	44 50	66 00	115 00

ROUGH STOPS,

LEVER HANDLE, FOR LEAD AND IRON PIPE, TUBE WASTE, STOP ON KEY.

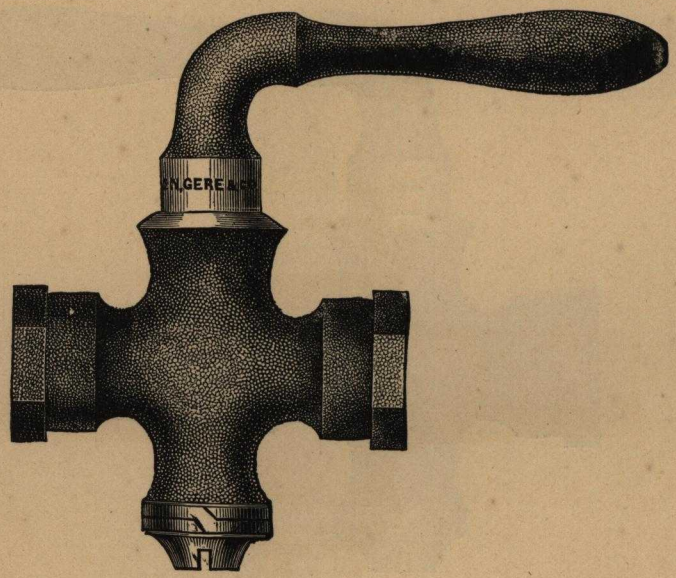
Fig. 50.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 8 50	$10 50	12 50	14 50	20 00	29 00	47 50	70 00	125 00

ROUGH STOPS,

LEVER HANDLE, SCREWED FOR IRON PIPE.

Fig. 51.



ROUGH STOPS,

LEVER HANDLE, SCREWED FOR IRON PIPE.

Fig. 51.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2
Per doz	$ 8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00

ROUGH STOPS,

LEVER HANDLE, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

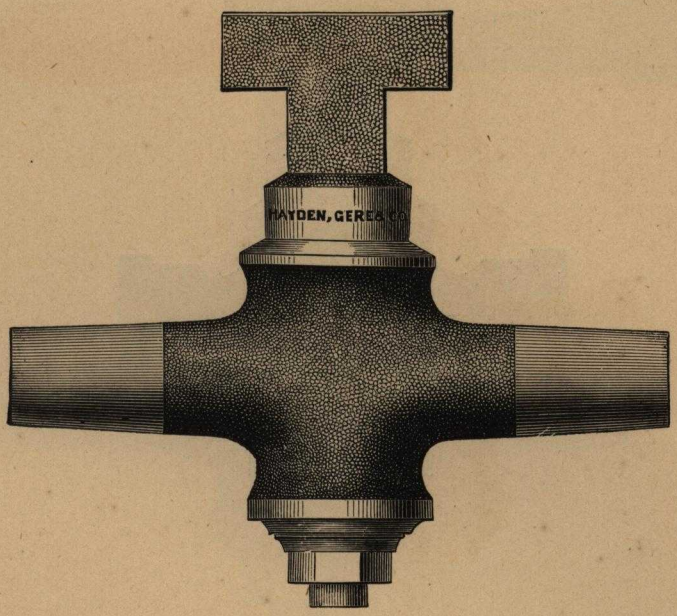
Fig. 52.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2
Per doz	$ 9 00	11 00	13 00	15 00	20 50	30 00	49 00	72 00	130 00

ROUGH STOPS,

T HANDLE, ROUND WAY, NUT AND WASHER.

Fig. 55.



ROUGH STOPS,

T HANDLE, ROUND WAY, NUT AND WASHER.

Fig. 55.

Size	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$ 13 00	15 00	17 00	23 00	36 00	54 00	84 00	140 00	180 00

ROUGH STOPS,

T HANDLE, ROUND WAY, NUT AND WASHER, TUBE WASTE, STOP ON KEY.

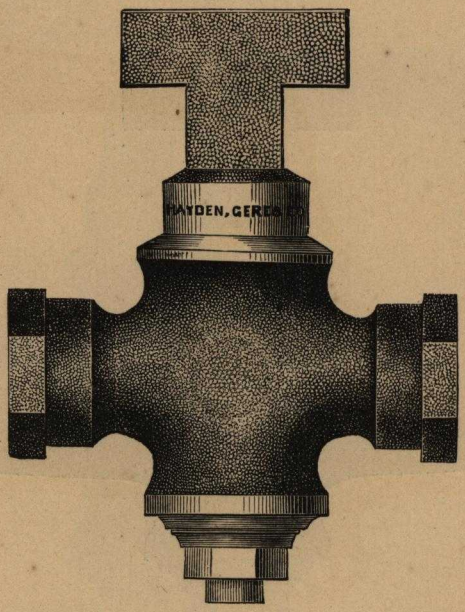
Fig. 56.

Size	⅜	½	⅝	¾	1	1¼	1½	1¾	2
Price	$ 14 00	16 00	18 00	24 50	38 00	57 00	88 00	148 00	190 00

ROUGH STOPS,

T HANDLE, ROUND WAY, NUT AND WASHER, SCREWED FOR IRON PIPE.

Fig. 57.



ROUGH STOPS,

T HANDLE, ROUND WAY, NUT AND WASHER, SCREWED FOR IRON PIPE.

Fig. 57.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$14 00	16 00	18 00	24 50	38 00	57 00	88 00	190 00

ROUGH STOPS,

T HANDLE, ROUND WAY, NUT AND WASHER, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

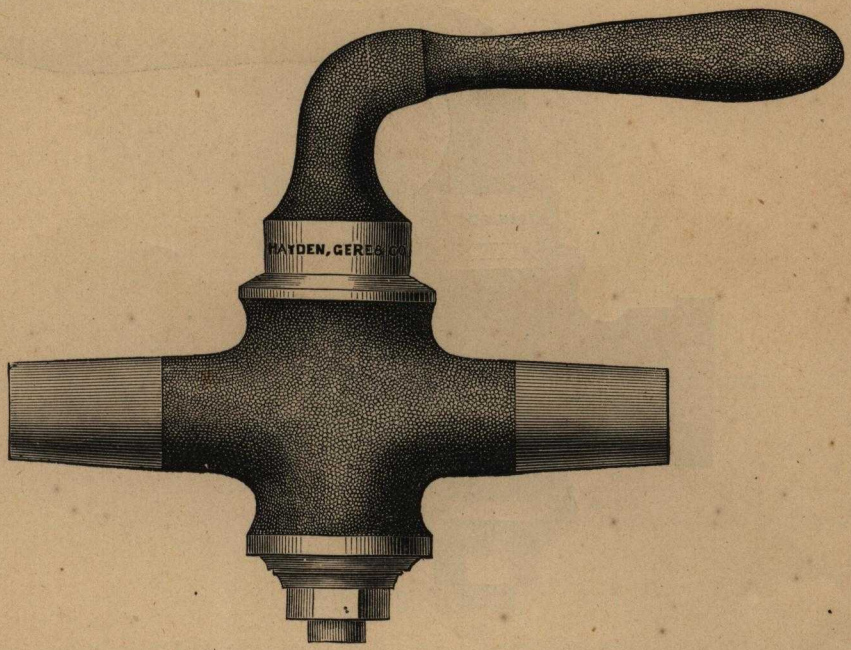
Fig. 58.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$15 00	17 00	19 00	26 00	40 00	60 00	92 00	200 00

ROUGH STOPS,

LEVER HANDLE, ROUND WAY.

Fig. 59.



ROUGH STOPS,

LEVER HANDLE, ROUND WAY.

Fig. 59.

Size	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$13 00	15 00	17 00	23 00	36 00	54 00	84 00	140 00	180 00

ROUGH STOPS,

LEVER HANDLE, ROUND WAY, TUBE WASTE, STOP ON KEY.

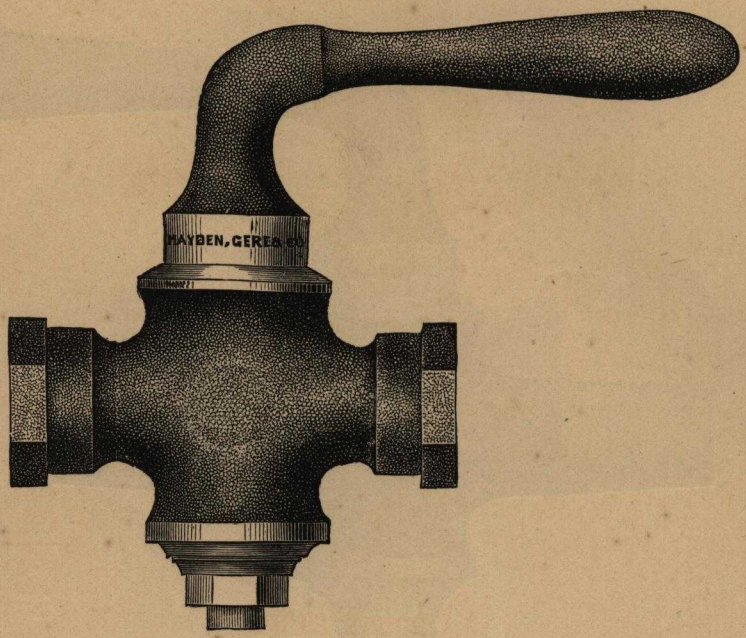
Fig. 60.

Size	⅜	½	⅝	¾	1	1¼	1½	1¾	2 in.
Per doz	$14 00	16 00	18 00	24 50	38 00	57 00	88 00	148 00	190 00

ROUGH STOPS,

LEVER HANDLE, ROUND WAY, SCREWED FOR IRON PIPE.

Fig. 61.



ROUGH STOPS,

LEVER HANDLE, ROUND WAY, SCREWED FOR IRON PIPE.

Fig. 61.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 14 00	16 00	18 00	24 50	38 00	57 00	88 00	190 00

ROUGH STOPS,

LEVER HANDLE, ROUND WAY, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

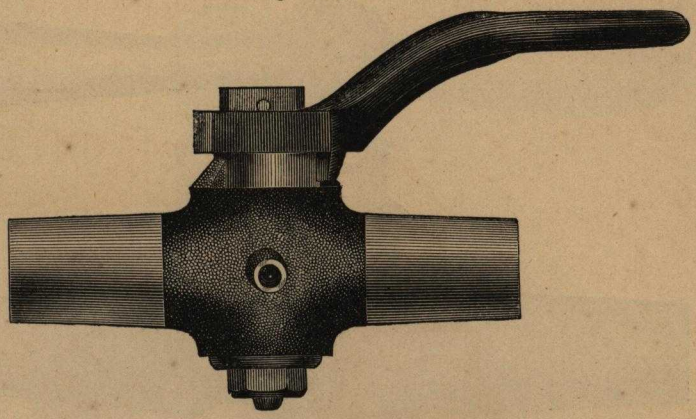
Fig. 62.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 15 00	17 00	19 00	26 00	40 00	60 00	92 00	200 00

ROUGH STOPS,

LEVER HANDLE, ROUND WAY, TUBE WASTE, STOP ON KEY, "H" PATTERN.

Fig. 63.



ROUGH STOPS,

LEVER HANDLE, ROUND WAY, TUBE WASTE, STOP ON KEY, "H" PATTERN.

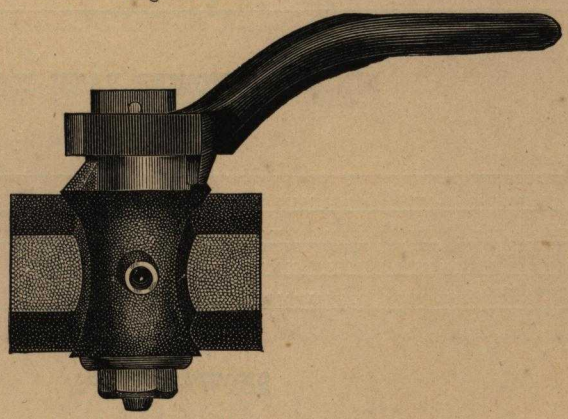
Fig. 63.

Size	¼	⅝	¾ in.
Per doz	$ 14 00	16 00	22 00

ROUGH STOPS,

LEVER HANDLE, ROUND WAY, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY, "H" PATTERN.

Fig. 64.



ROUGH STOPS,

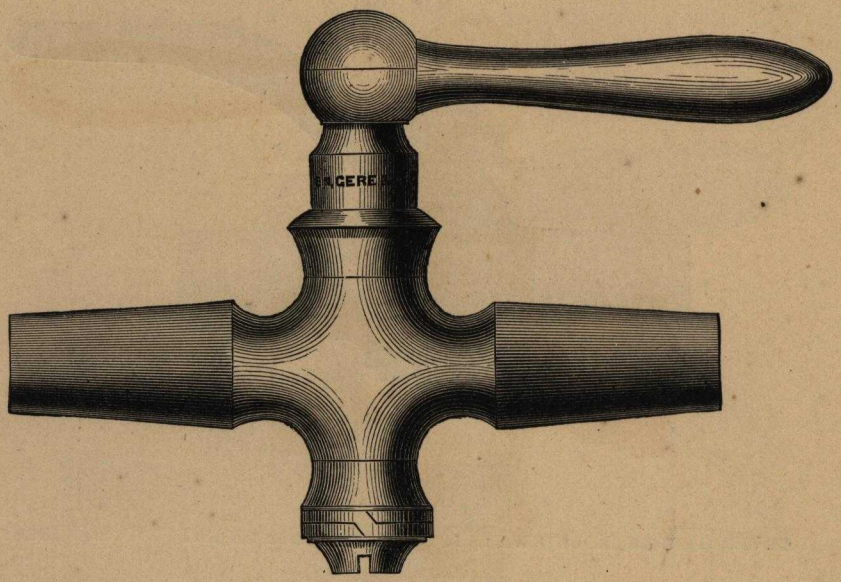
LEVER HANDLE, ROUND WAY, SCREWED FOR IRON PIPE, TUBE WASTE, STOP ON KEY, "H" PATTERN.

Fig. 64.

Size	½	¾	1 in.
Per doz	$ 12 00	15 00	24 00

PLAIN STOPS.

Fig. 69.



FINISHED PLAIN STOPS.

Fig. 69.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2
Per doz	$9 50	11 50	15 00	18 50	25 00	37 00	55 50	86 00	134 00	175 00
Nickel-Plated, per doz	11 50	14 00	17 50	21 00	27 50	40 00				
Silver-Plated, per doz	17 00	19 00	27 00	30 50	40 00	63 00				

FINISHED SHOWER BATH COCKS.

Fig. 71.

Size	⅜	½	⅝	¾	1 in.
Per doz	$13 00	16 50	20 00	26 50	40 00
Nickel-Plated, per doz	15 00	19 00	22 50	29 00	43 00
Silver-Plated, per doz	20 50	25 50	32 00	41 50	66 00

SHOWER STOPS,

FLANGE AND HANDLE.

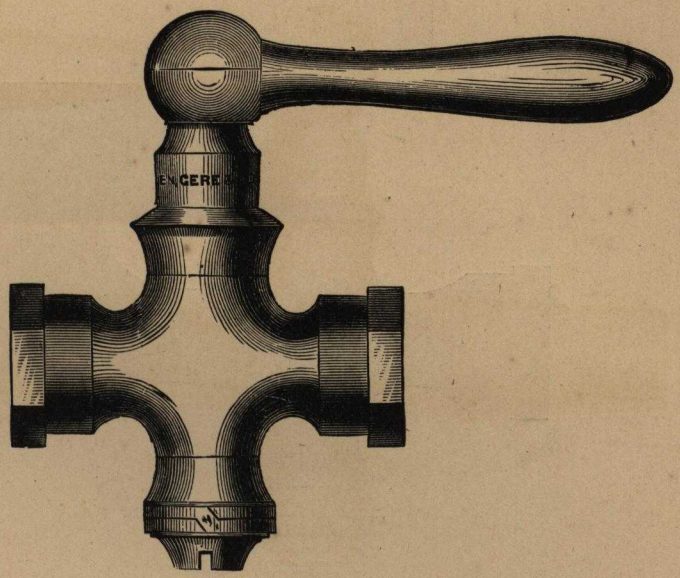
Fig. 73.

Size	½	⅝	¾ in.
Finished Flange and Handle, per doz	$ 22 00	27 00	34 00
Nickel-Plated Flange and Handle, per doz	24 50	29 50	36 50
Silver-Plated Flange and Handle, per doz	31 00	39 00	51 50

PLAIN STOPS,

SCREWED FOR IRON PIPE.

Fig. 70.



FINISHED PLAIN STOPS,

SCREWED FOR IRON PIPE,

Fig. 70.

Size	¼	⅜	½	⅝	¾	1	1¼	1½ in.
Per doz	$ 10 50	12 50	16 00	19 50	26 50	39 00	58 50	90 00
Nickel-Plated, per doz	12 50	14 50	18 50	22 00	29 00	42 00		
Silver-Plated, per doz	18 00	20 00	25 00	31 50	41 50	65 00		

FINISHED SHOWER BATH COCKS,

SCREWED FOR IRON PIPE.

Fig. 72.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 14 00	17 50	21 00	28 00	42 00
Nickel-Plated, per doz	16 00	20 00	23 50	30 50	45 00
Silver-Plated, per doz	21 50	26 50	33 00	43 00	68 00

SHOWER STOPS,

FLANGE AND HANDLE, SCREWED FOR IRON PIPE.

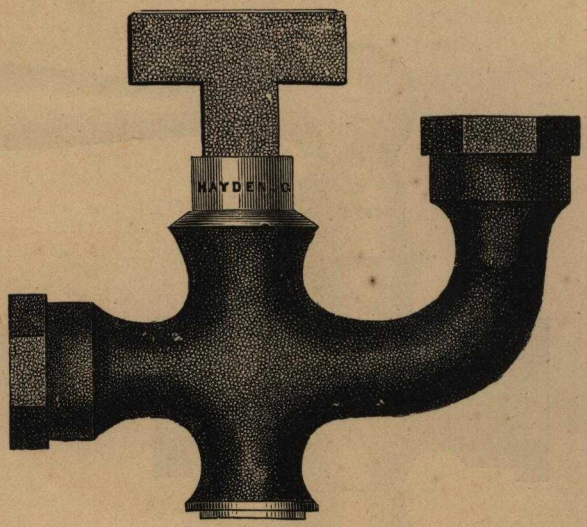
Fig. 74.

Size	½	⅝	¾ in.
Rough Finished Flange and Handle, per doz	$ 23 00	28 00	35 50
Rough Nickel-Plated Flange and Handle, per doz	25 50	30 50	38 00
Rough Silver-Plated Flange and Handle, per doz	32 00	40 00	50 50

HYDRANT COCKS,

RIVET, SCREWED FOR IRON PIPE.

Fig. 82.



HYDRANT COCKS,

RIVET BOTTOM.

Fig. 80.

Size	½	⅝	¾	1 in.
Per doz	$ 10 50	13 00	17 50	26 00

RIVET BOTTOM, FOR LEAD AND IRON PIPE.

Fig. 81.

Size	½	⅝	¾	1 in.
Per doz	$ 11 00	13 50	18 50	27 00

RIVET BOTTOM, SCREWED FOR IRON PIPE.

Fig. 82.

Size	½	⅝	¾	1 in.
Per doz	$ 11 50	14 00	19 00	28 00

NUT AND WASHER, BOTTOM, FOR LEAD PIPE.

Fig. 83.

Size	½	⅝	¾	1 in.
Per doz	$ 11 50	14 00	19 00	28 00

NUT AND WASHER, BOTTOM, FOR LEAD AND IRON PIPE.

Fig. 84.

Size	½	⅝	¾	1 in.
Per doz	$ 12 00	14 50	20 00	29 00

NUT AND WASHER, BOTTOM, SCREWED FOR IRON PIPE.

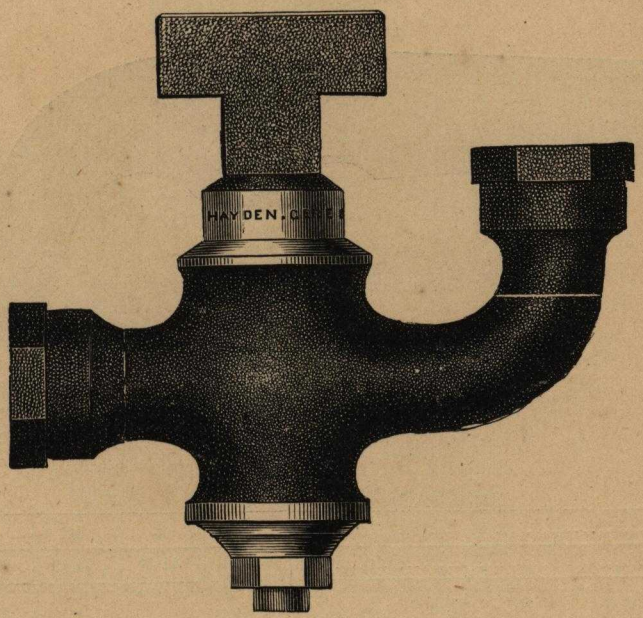
Fig. 85.

Size	½	⅝	¾	1 in.
Per doz	$ 12 00	15 00	20 50	30 00

HYDRANT COCKS,

ROUND WAY, NUT AND WASHER, SCREWED FOR IRON PIPE.

Fig. 88.



HYDRANT COCKS,

NUT AND WASHER, ROUND WAY.

Fig. 86.

Size	½	⅝	¾	1 in.
Per doz	$ 15 50	13 00	24 00	37 00

HYDRANT COCKS,

ROUND WAY, NUT AND WASHER, FOR LEAD AND IRON PIPE.

Fig. 87.

Size	½	⅝	¾	1 in.
Per doz	$ 16 00	18 50	25 00	38 00

HYDRANT COCKS,

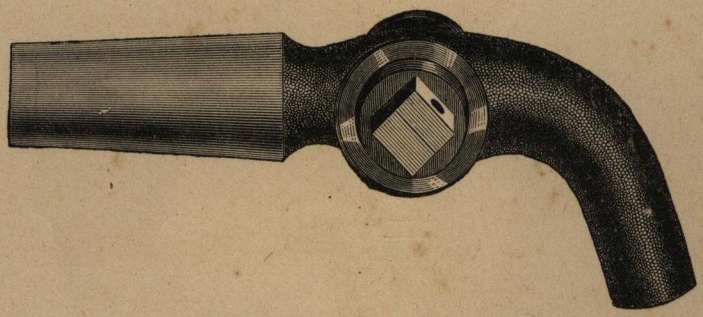
ROUND WAY, NUT AND WASHER, SCREWED FOR IRON PIPE.

Fig. 88.

Size	½	⅝	¾	1 in.
Per doz	$ 16 50	19 00	25 50	39 00

BALL COCKS.

Fig. 90.



BALL COCKS.

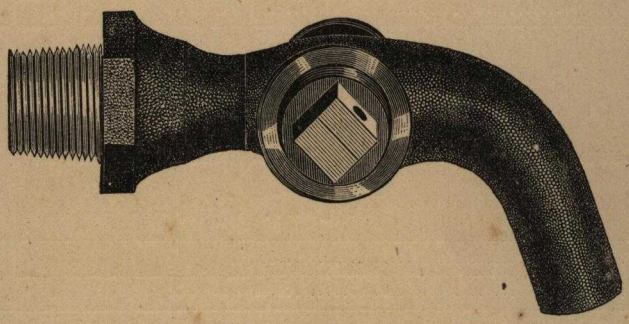
Fig. 90.

Size	⅜	½	⅝	¾	1	1¼ in.
Per doz	$ 9 00	11 00	14 00	18 00	28 00	46 00

BALL COCKS,

SCREWED FOR IRON PIPE.

Fig 91.



BALL COCKS,

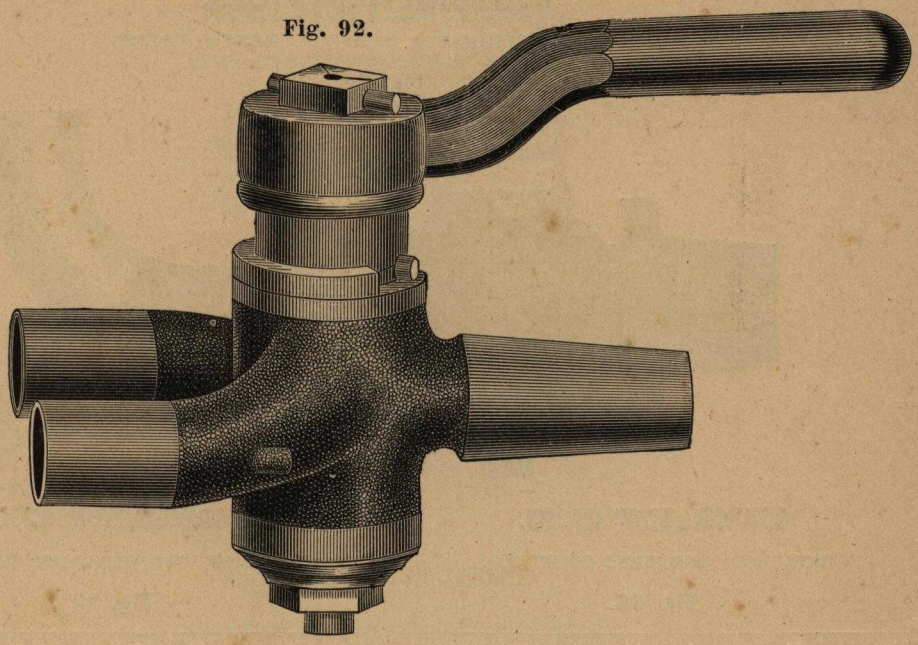
SCREWED FOR IRON PIPE.

Fig. 91.

Size	⅜	½	⅝	¾	1	1¼ in.
Per doz	$10 00	12 00	15 00	19 50	30 00	50 00

RAIN AND WELL WATER COCKS.

Fig. 92.



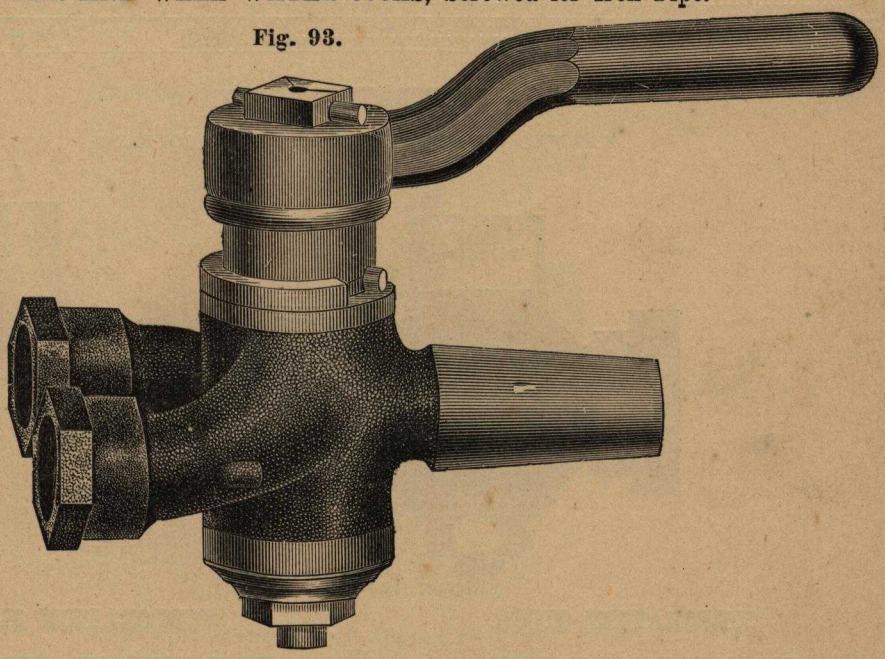
RAIN AND WELL WATER COCKS.

Fig. 92.

Size	¾	1	1¼	1½	2 in.
Per doz	$ 45 00	70 00	80 00	120 00	200 00

RAIN AND WELL WATER COCKS, Screwed for Iron Pipe.

Fig. 93.



RAIN AND WELL WATER COCKS, Screwed for Iron Pipe.

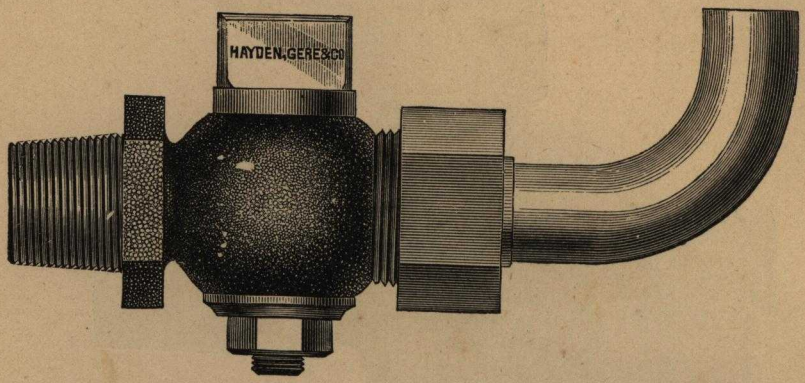
Fig. 93.

Size	¾	1	1¼	1½	2 in.
Per doz	$ 43 00	74 00	86 00	128 00	220 00

CORPORATION STOPS,

SCREWED OUTSIDE FOR IRON PIPE, BENT COUPLING.

Fig. 96.



CORPORATION STOPS,

FOR IRON PIPE, BENT COUPLING.

Fig. 96.

Size.....	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz..	$12 00	14 00	18 00	27 00	42 00	96 00	128 00	220 00

CORPORATION STOPS,

FOR IRON PIPE, STRAIGHT COUPLING.

Fig. 97.

Size.....	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz..	$12 00	14 00	18 00	27 00	42 00	96 00	128 00	220 00

CORPORATION STOPS,

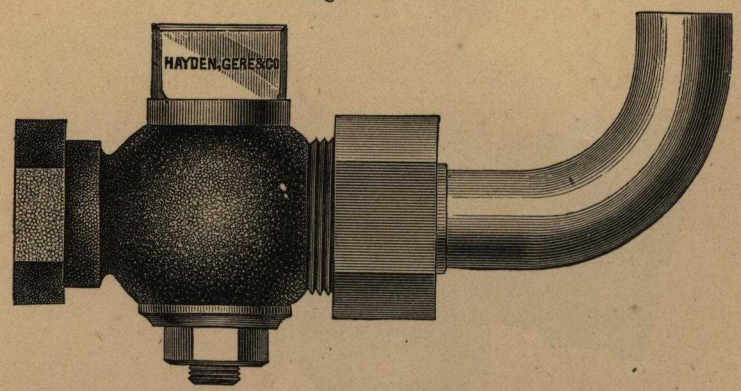
THREADED TO SUIT MUELLER'S PATENT TAPPING MACHINE.

Size.....	⅜	½	⅝	¾	1 in.
Per doz.....	$ 12 00	14 00	18 00	27 00	42 00

CORPORATION STOPS,

SCREWED INSIDE FOR IRON PIPE, BENT COUPLING.

Fig. 98.



CORPORATION STOPS,

FOR IRON PIPE, BENT COUPLING.

Fig. 98.

Size.....	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz..	$12 00	14 00	18 00	27 00	42 00	96 00	128 00	220 00

CORPORATION STOPS,

FOR IRON PIPE, STRAIGHT COUPLING.

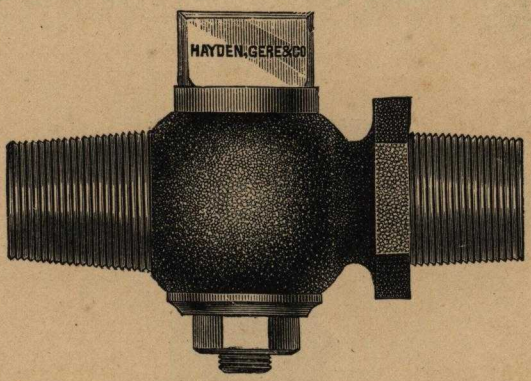
Fig. 99.

Size.....	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz..	$12 00	14 00	18 00	27 00	42 00	96 00	128 00	220 00

CORPORATION STOPS,

BOTH ENDS SCREWED FOR IRON PIPE.

Fig. 100.



CORPORATION STOPS,

BOTH ENDS SCREWED FOR IRON PIPE.

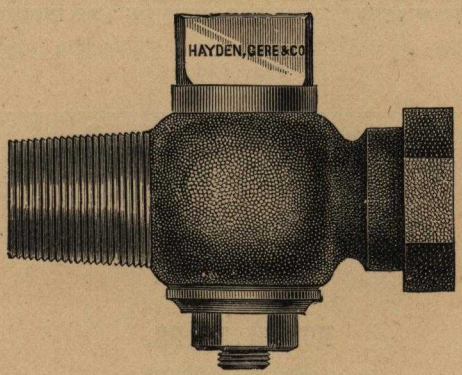
Fig. 100.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$10 00	12 00	15 00	23 00	36 00	80 00	100 00	180 00

CORPORATION STOPS,

SCREWED OUTSIDE AND INSIDE FOR IRON PIPE.

Fig. 101.



CORPORATION STOPS,

SCREWED OUTSIDE AND INSIDE FOR IRON PIPE.

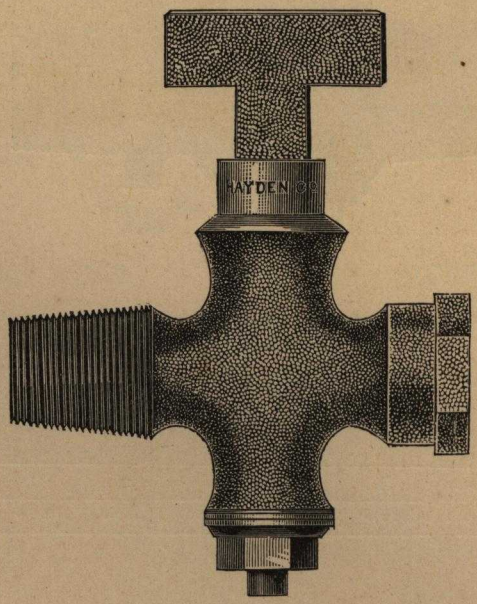
Fig. 101.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 10 00	12 00	15 00	23 00	36 00	80 00	100 00	180 00

ROUGH STOPS,

T HANDLE, NUT AND WASHER, SCREWED OUTSIDE AND INSIDE FOR IRON PIPE.

Fig. 451.



ROUGH STOPS,

T HANDLE, NUT AND WASHER, SCREWED OUTSIDE AND INSIDE FOR IRON PIPE.

Fig. 451.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00

ROUGH STOPS,.

T HANDLE, NUT AND WASHER, SCREWED OUTSIDE AND INSIDE FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

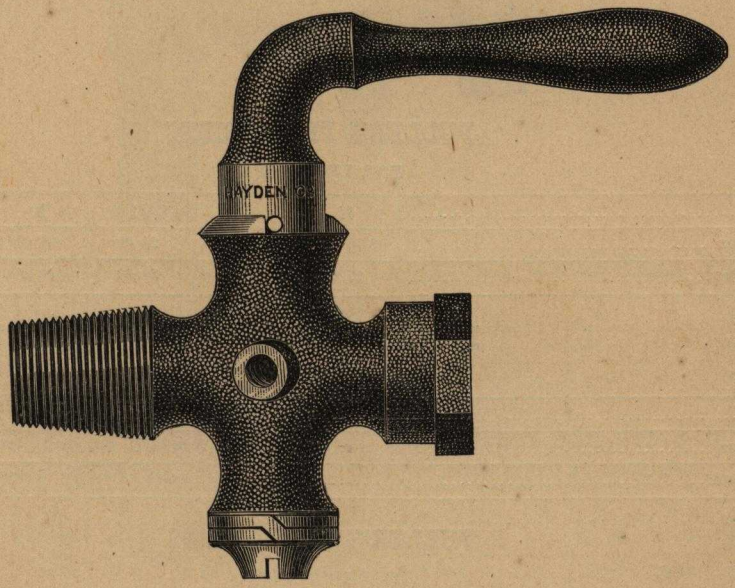
Fig. 452.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 00	11 00	13 00	15 00	20 50	30 00	49 00	72 00	130 00

ROUGH STOPS,

LEVER HANDLE, SCREWED OUTSIDE AND INSIDE FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

Fig. 454.



ROUGH STOPS,

LEVER HANDLE, SCREWED OUTSIDE AND INSIDE FOR IRON PIPE.

Fig. 453.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00

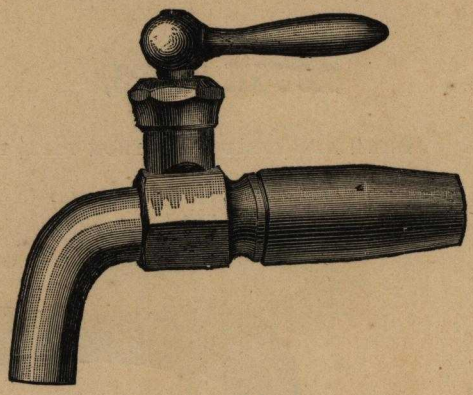
ROUGH STOPS,

LEVER HANDLE, SCREWED OUTSIDE AND INSIDE FOR IRON PIPE, TUBE WASTE, STOP ON KEY.

Fig. 454.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 00	11 00	13 00	15 00	20 50	30 00	49 00	72 00	130 00

FULLER'S PLAIN BIBBS.



FULLER'S PLAIN BIBBS,

FOR LEAD PIPE.

Size	⅜	½	⅝	¾	1	1¼ in.
Brass, per doz	$ 15 00	18 00	20 00	24 00	36 00	56 00
Plated, per doz	27 00	33 00	38 00	49 00	54 00	

FULLER'S PLAIN BIBBS,

FLANGE AND THIMBLE.

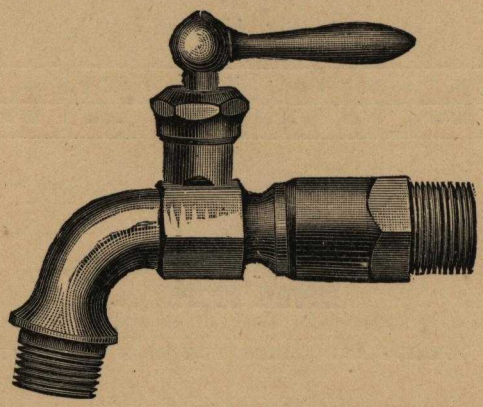
Size	⅜	½	⅝	¾	1 in.
Brass, per doz	$ 22 00	24 00	26 00	34 00	48 00
Plated, per doz	42 00	48 00	56 00	66 00	84 00

FULLER'S PLAIN BIBBS,

FOR IRON PIPE.

Size	½	⅝	¾	1 in.
Brass, per doz	$ 20 00	24 00	30 00	36 00
Plated, per doz	35 00	40 00	51 00	56 00

FULLER'S IRON PIPE AND HOSE BIBBS.



FULLER'S HOSE BIBBS, For Lead Pipe.

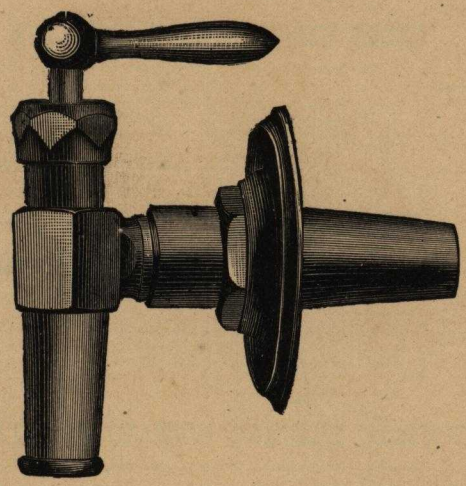
Size	½	⅝	¾	1 in.
Brass, per doz	$ 20 50	24 00	28 00	35 00
Plated, per doz	35 00	40 00	51 00	56 00

FULLER'S HOSE BIBBS, For Iron Pipe.

Size	½	⅝	¾	1 in.
Brass, per doz	$ 23 50	27 00	32 00	40 00
Rough, per doz	22 00	25 50	30 00	37 00

FULLER'S UPRIGHT BIBBS,

FLANGE AND THIMBLE.



FULLER'S UPRIGHT BIBBS.

Size	½	⅝	¾	1
Brass, per doz	$18 00	20 00	24 00	36 00
Plated, per doz	33 00	38 00	40 00	48 00

FULLER'S WASH TRAY BIBBS.

Size	½	⅝	¾	1
Brass, per doz	$18 75	22 50	27 50	36 00
Plated, per doz	36 00	48 00	56 00	72 00

FULLER'S UPRIGHT BIBBS,

FLANGE AND THIMBLE.

Size	½	⅝	¾	1
Brass, per doz	$24 00	26 00	34 00	48 00
Plated, per doz	40 00	44 00	50 00	70 00

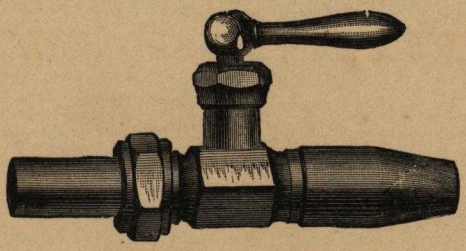
FULLER'S WASH TRAY BIBBS,

FLANGE AND THIMBLE.

Size	½	⅝	¾	1
Brass, per doz	$24 00	26 00	34 00	48 00
Plated, per doz	40 00	44 00	48 00	60 00

FULLER'S STOPS,

WITH COUPLING.



FULLER'S STOPS,

WITH COUPLING.

Size	½	⅝	¾	1	1¼	1½	1¾	2 in.
Rough, per doz	$ 17 00	21 50	25 50	34 00	56 00	66 00	90 00	103 00
Brass, per doz	18 75	22 50	27 50	36 00	60 00	72 00	96 00	110 00
Plated, per doz	36 00	48 00	56 00	72 00				

Fuller's Long Stem Hopper Cocks.

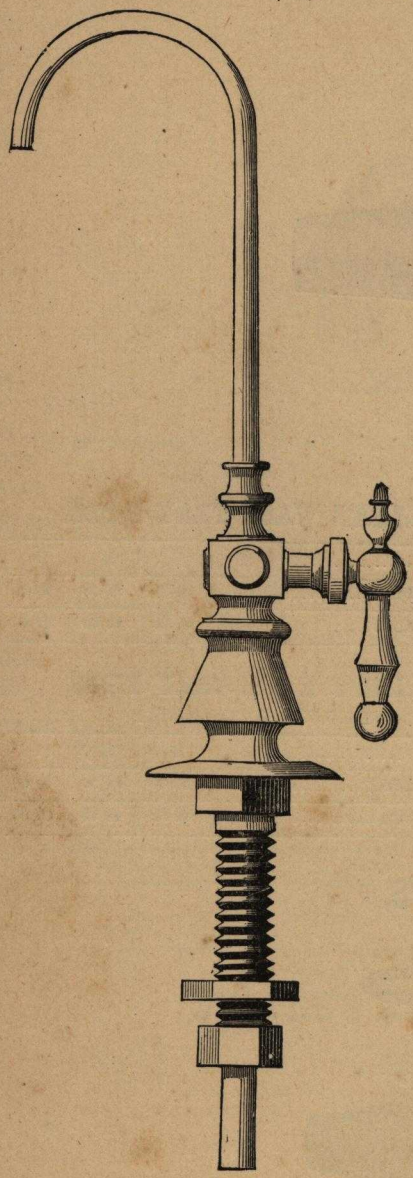
Size	½	⅝	¾ in.
Brass, per doz	$23 00	27 00	33 00

Add for Plated Handle and Flange, $5.00 per doz. extra net.

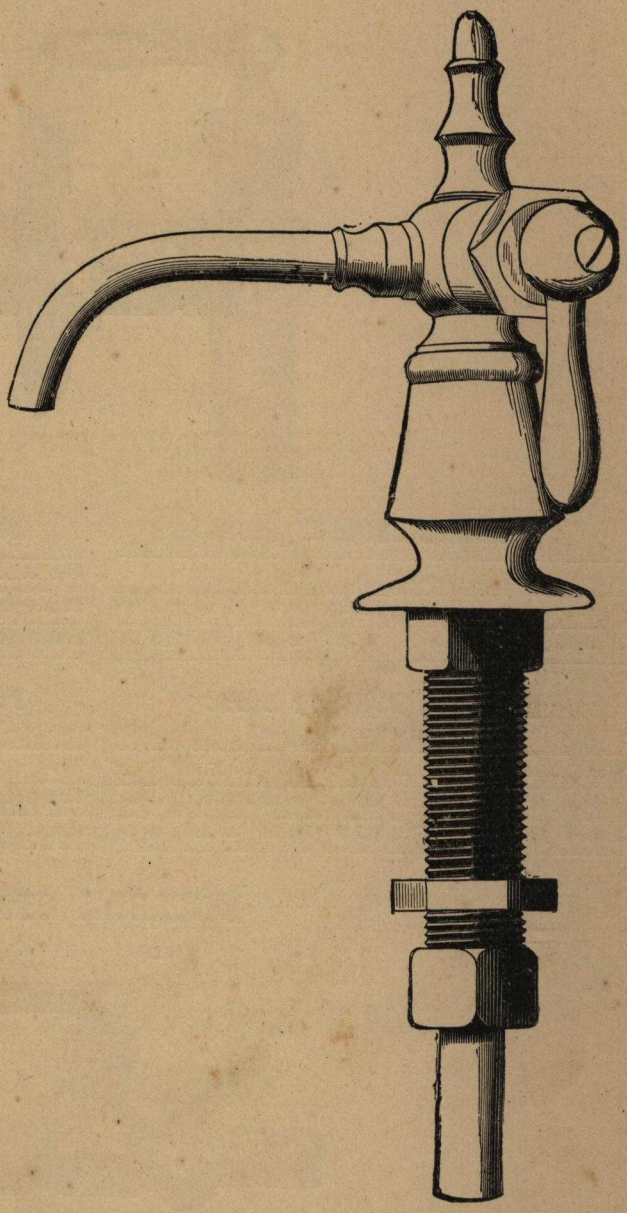
Fuller's Ball Cocks and Balls.

Size	½	⅝	¾	1 in.
Per doz	$ 27 00	32 00	40 00	48 00

FULLER'S PANTRY OR COUNTER COCKS.



FULLER'S NO. 1 BASIN COCKS.



FULLER'S BASIN COCKS.

Number	1	2	3	4	4½
Description					Ring Cup Top.
Brass, per doz	$ 33 00	36 50	46 00	56 00	66 00
Plated, per doz	46 50	50 00	60 00	70 00	82 00

FULLER'S BASIN COCKS.

Number	5	5½	6	7
Description		Ring Cup Top.	Large Octagon	Ex. Large Oval
Brass, per doz	$ 66 00	72 00	168 00	198 00
Plated, per doz	80 00	88 00	192 00	228 00

FULLER'S COCKS---Continued.

FULLER'S DOUBLE BASIN COCKS.

	Round Pattern.	Oval Pattern.
Brass, each	$ 12 00	13 50
Plated, each	14 00	15 50

FULLER'S DOUBLE BASIN COCKS.

SOAP CUP TOP, OVAL PATTERN.

Brass, each	$ 16 00
Plated, each	18 00

Round Pattern, $2.00 less.

FULLER'S COMBINATION BRACKET BASIN COCKS.

Brass, each	$ 10 00
Plated, each	12 00

FULLER'S PANTRY OR COUNTER COCKS.

Number	2	4	5
Brass, per doz	$ 36 00	40 00	45 00
Plated, per doz	50 00	56 00	62 00

Bases same as Nos. 2, 4 and 5, Basin Cocks.

FULLER'S DOUBLE PANTRY COCKS.

	Round Pattern.	Oval Pattern.
Brass, each	$ 12 00	14 00
Plated, each	13 50	15 50

FULLER'S COMBINATION SHAMPOOING COCKS.

No. 1.

With Hose and Sprinkler, plated, each	$ 13 00
Larger Pattern, each	16 00

No. 2.

Large, with Swing Shampoo Sprinkler, for centre of Slab, each	$ 22 00

FULLER'S HOSE PIPES.

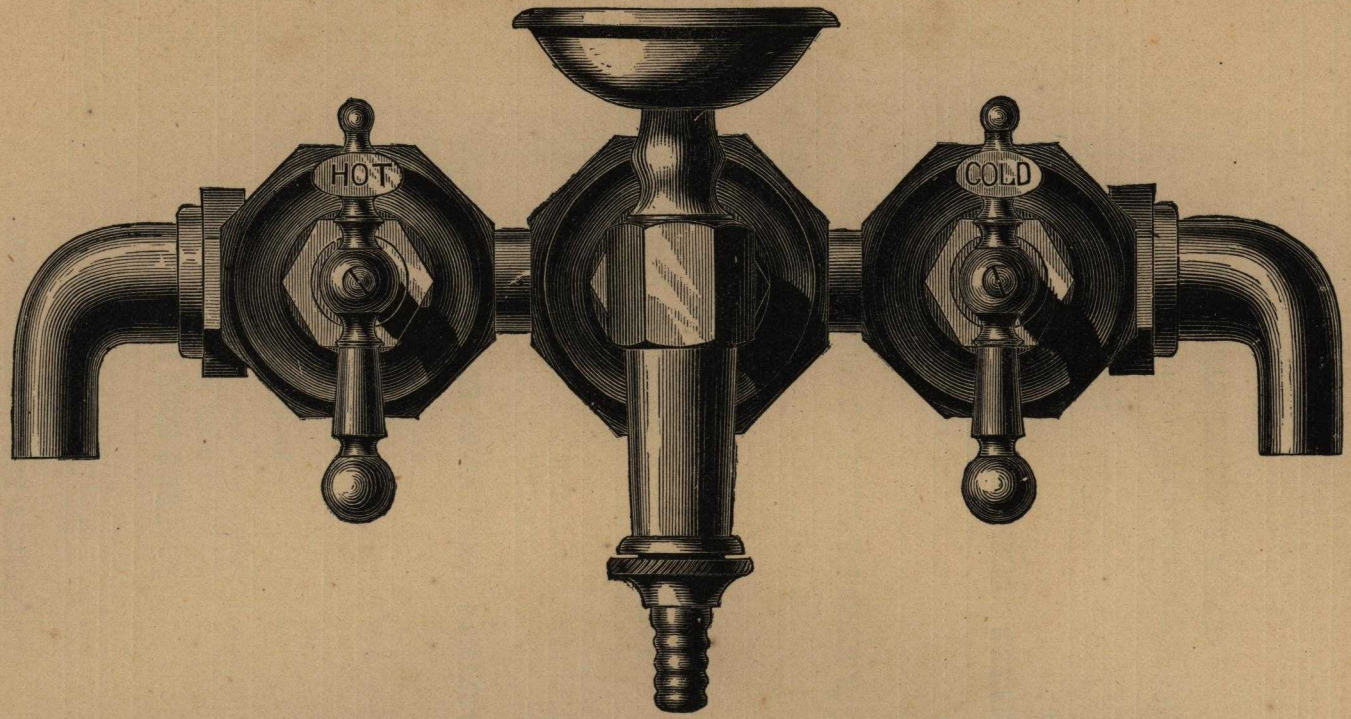
Size	¾	1 in.
Price, per doz	$ 18 00	30 00

TRIMMINGS FOR FULLER'S WORK.

Size	½	⅝	¾	1	1¼ in.
Eccentrics, per doz. net	$ 3 00	3 00	4 00	6 00	
Balls, per doz. net	75	75	1 00	1 25	2 00
Ball Stems, with Balls, per doz. net	3 00	3 00	4 00	6 00	

FULLER'S NO. 1 COMBINATION BATH COCKS,

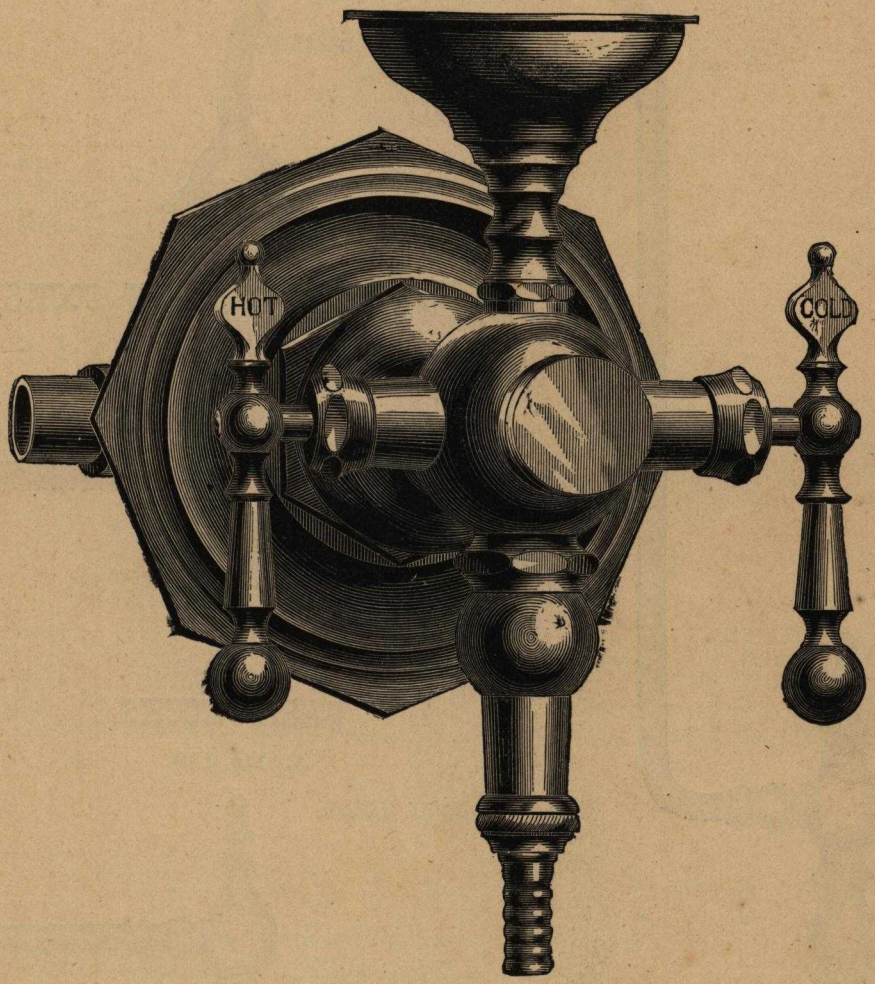
COMPLETE WITH COUPLINGS AND RUBBER TUBE.



FULLER'S COMBINATION BATH COCKS, Complete with Couplings and Rubber Tube.

Number	1	1½	2	2½
Description	With Ring Cup, Handles in Front.	With Ring Cup, Handles on Top.	With Soap Cup, Handles on Top.	With Soap Cup, Handles in Front.
Brass, each	$ 10 50	10 50	13 00	13 00
Plated, each	12 00	12 00	15 00	15 00

FULLER'S No. 3 COMBINATION BATH COCKS.



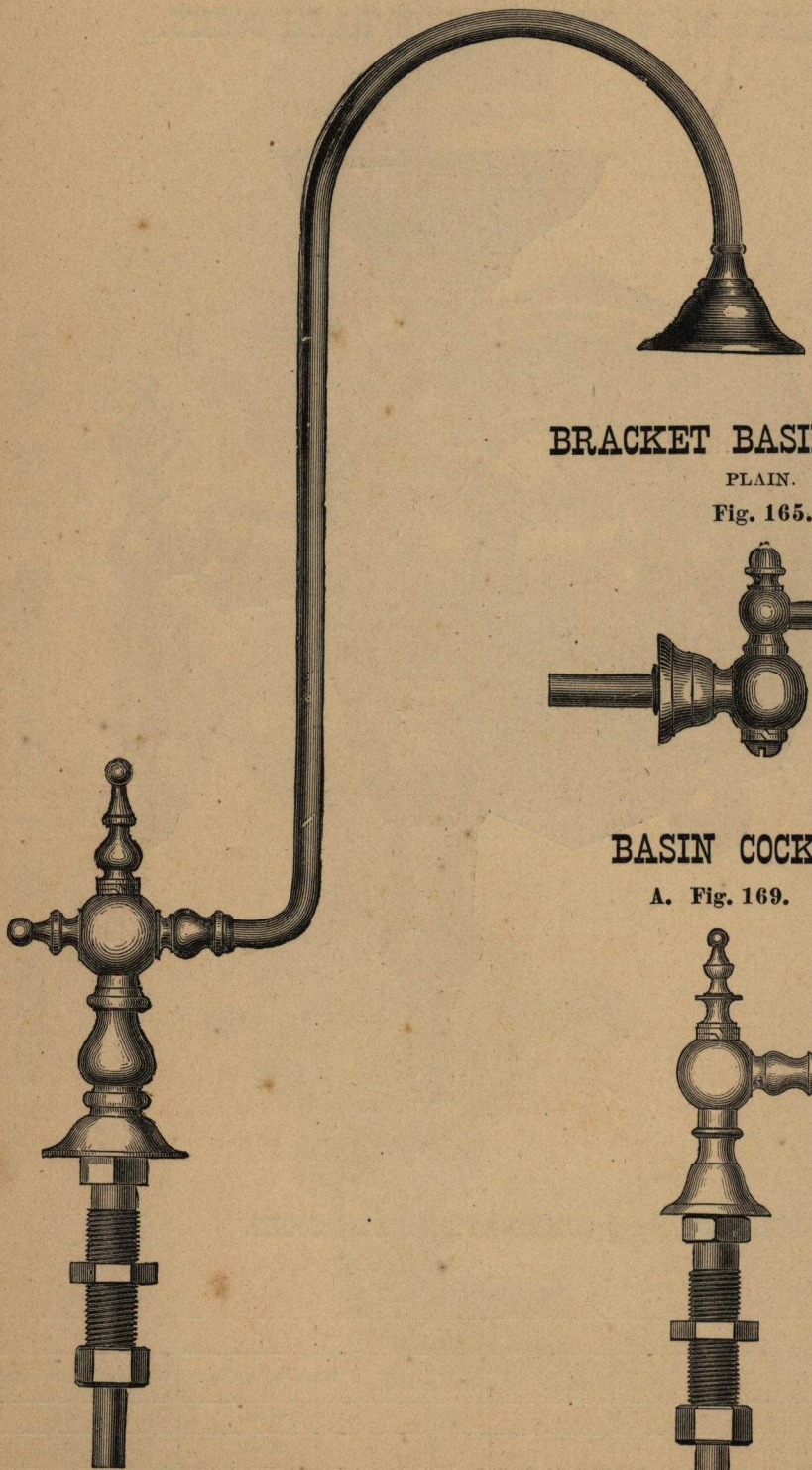
FULLER'S No. 3 COMBINATION BATH COCKS.

Number	3	3½	4	4
Description	With Ring Cup, Handles on side.	With Soap Cup, Handles on side.	With Soap Cup.	Without Soap Cup.
Brass, each	$ 14 00	16 00	18 00	17 00
Plated, each	16 00	18 00	21 00	20 00

SHAMPOOING COCKS,

UPRIGHT.

Fig. 185.

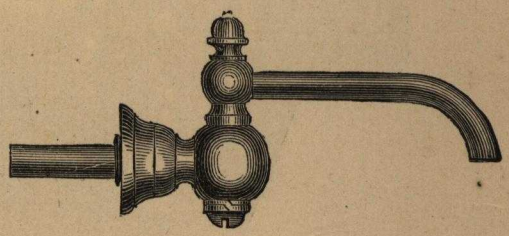


FINISHED AND PLATED.
Letters correspond with Basin Cocks.

BRACKET BASIN COCKS,

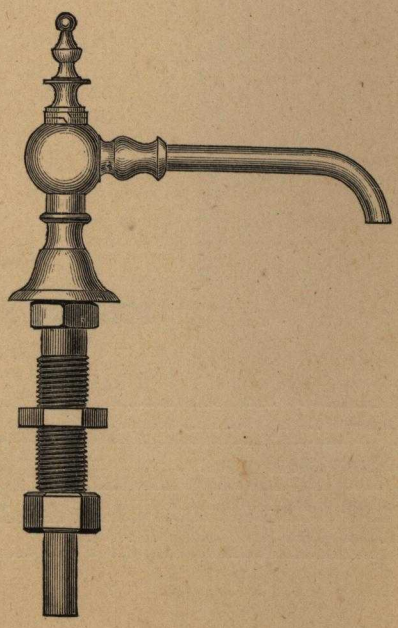
PLAIN.

Fig. 165.



BASIN COCKS.

A. Fig. 169.



BRACKET BASIN COCKS,

PLAIN.

Fig. 165.

Finished, per doz	$ 18 00
Nickel-Plated, per doz	22 00
Silver-Plated, per doz	26 00

BRACKET BASIN COCKS,

OCTAGON.

Fig. 166.

Finished, per doz	$ 30 00
Nickel-Plated, per doz	36 00
Silver-Plated, per doz	40 00

BRACKET SHAMPOOING COCKS.

Fig. 167.

Finished, per doz	$ 24 00
Nickel-Plated, per doz	28 00
Silver-Plated, per doz	32 00

DOUBLE SHAMPOOING AND BASIN COCKS.

Fig. 186.

Finished, each	$ 24 00
Nickel-Plated, each	28 00
Silver-Plated, each	34 00

BASIN COCKS.

Figures	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184
Description	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Finished, per doz	$14 00	16 00	20 00	18 00	20 00	21 00	16 00	20 00	22 00	36 00	26 00	60 00	30 00	48 00	100 00	80 00
Nickel-Plated, per doz.	17 00	19 00	23 00	21 00	23 00	24 00	19 00	23 00	26 00	40 00	30 00	68 00	36 00	54 00	120 00	95 00
Silver-Plated, per doz.	24 00	26 00	30 00	28 00	30 00	31 00	26 00	30 00	34 00	50 00	38 00	80 00	42 00	60 00	130 00	100 00

SHAMPOOING COCKS,

UPRIGHT.

Fig. 185.

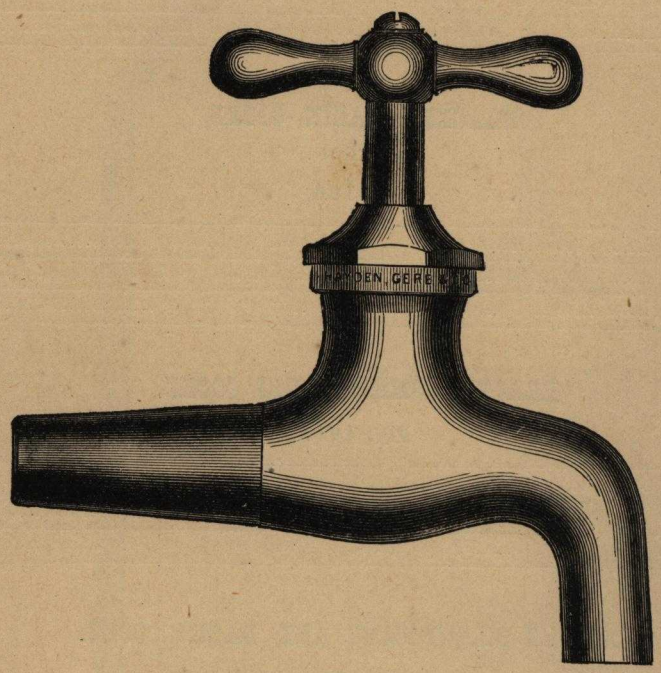
Letters correspond with Basin Cocks.

Description	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Finished, per doz	$26 00	28 00	32 00	30 00	32 00	33 00	28 00	32 00	34 00	48 00	38 00	72 00	42 00	60 00	112 00	92 00
Nickel-Plated, per doz.	29 00	31 00	35 00	33 00	35 00	36 00	31 00	35 00	38 00	52 00	42 00	80 00	48 00	66 00	132 00	107 00
Silver-Plated, per doz.	36 00	38 00	42 00	40 00	42 00	43 00	38 00	42 00	46 00	62 00	50 00	92 00	54 00	72 00	142 00	112 00

COMPRESSION WORK.

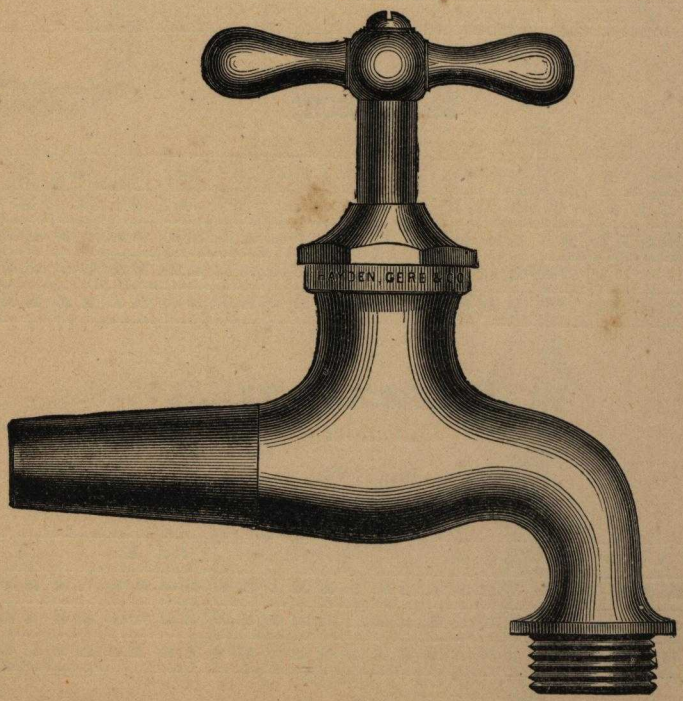
COMPRESSION PLAIN BIBBS.

Fig. 188.



COMPRESSION HOSE BIBBS.

Fig. 190.



ROUGH COMPRESSION PLAIN BIBBS.

Fig. 187.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 8 50	9 50	11 00	17 00	30 00	44 00	68 00	140 00

FINISHED COMPRESSION PLAIN BIBBS.

Fig. 188.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 00	10 00	12 00	18 00	34 00	52 00	80 00	160 00
Nickel-Plated, per doz	11 00	12 50	14 50	20 50	37 00			
Silver-Plated, per doz	16 50	19 00	24 00	33 00	60 00			

FINISHED COMPRESSION PLAIN BIBBS,

WITH STUFFING BOX.

Fig. 457.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 11 00	12 00	14 00	20 00	37 00
Nickel-Plated, per doz	13 00	14 50	16 50	22 50	40 00
Silver-Plated, per doz	18 50	21 00	26 00	35 00	63 00

ROUGH COMPRESSION HOSE BIBBS.

Fig. 189.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 50	10 50	12 00	19 00	33 00	48 00	74 00	150 00

FINISHED COMPRESSION HOSE BIBBS.

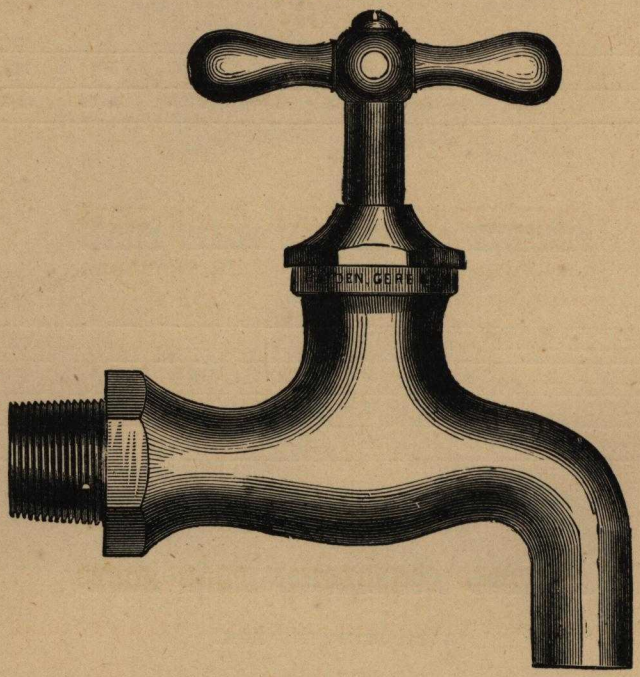
Fig. 190.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 10 00	11 00	13 00	20 00	37 00	56 00	86 00	170 00
Nickel-Plated, per doz	12 00	13 50	15 50	22 50	40 00			
Silver-Plated, per doz	17 50	20 00	25 00	35 00	63 00			

COMPRESSION PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

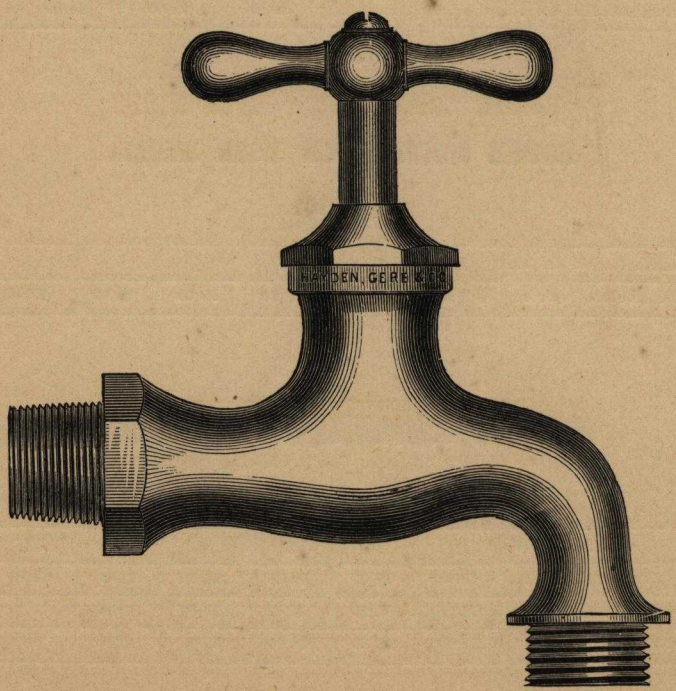
Fig. 196.



COMPRESSION HOSE BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 198.



ROUGH COMPRESSION PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 195.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 9 50	10 50	12 00	19 00	33 00	48 00	74 00	150 00

FINISHED COMPRESSION PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 196.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 10 00	11 00	13 00	20 00	37 00	56 00	80 00	170 00
Nickel-Plated, per doz	12 00	13 50	15 50	22 50	40 00			
Silver-Plated, per doz	17 50	20 00	25 00	35 00	63 00			

FINISHED COMPRESSION PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER, WITH STUFFING BOX.

Fig 458.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 12 00	13 00	15 00	22 00	30 00
Nickel-Plated, per doz	14 00	15 50	17 50	24 50	43 00
Silver-Plated, per doz	19 50	22 00	27 00	37 00	66 00

ROUGH COMPRESSION HOSE BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 197.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$10 50	11 50	13 00	21 00	36 00	52 00	80 00	160 00

FINISHED COMPRESSION HOSE BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

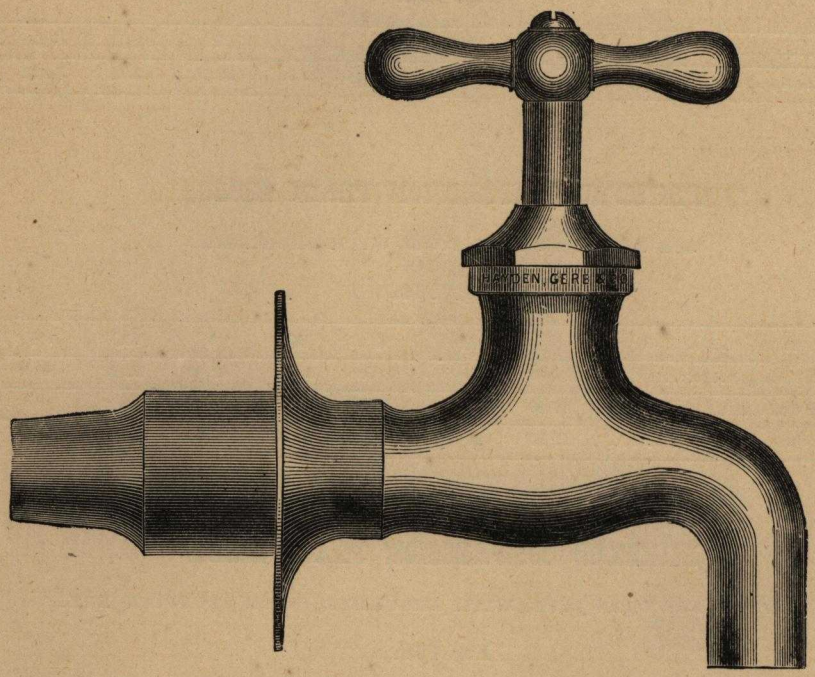
Fig. 198.

Size	⅜	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 11 00	12 00	14 00	22 00	40 00	60 00	92 00	180 00
Nickel-Plated, per doz	13 00	14 50	16 50	24 50	43 00			
Silver-Plated, per doz	18 50	21 00	26 00	37 00	66 00			

COMPRESSION PLAIN BIBBS,

FLANGE AND THIMBLE.

Fig. 199.



FINISHED COMPRESSION PLAIN BIBBS,

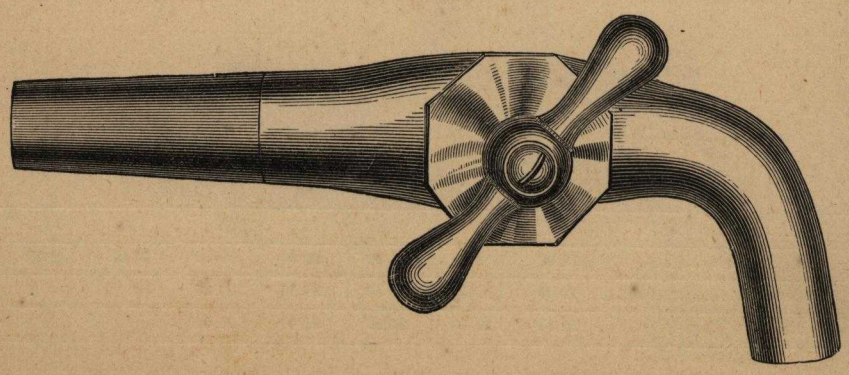
FLANGE AND THIMBLE.

Fig. 199.

Size	⅜	½	⅝	¾	1	1¼ in.
Per doz	$15 00	17 00	20 00	28 00	51 00	74 00
Nickel-Plated, per doz	18 00	20 50	23 50	32 00	55 00	
Silver Plated, per doz	24 00	28 00	35 00	44 00	79 00	

COMPRESSION WASH TRAY BIBBS.

Fig. 203.



COMPRESSION BIBBS.---Continued.

FINISHED COMPRESSION WASH TRAY BIBBS.

Fig. 203.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 9 00	10 00	12 00	18 00	34 00
Nickel-Plated, per doz	11 00	12 50	14 50	20 50	37 00
Silver-Plated, per doz	16 50	19 00	24 00	33 00	60 00

FINISHED COMPRESSION WASH TRAY BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 205.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 10 00	11 00	13 00	20 00	37 00
Nickel-Plated, per doz	12 00	13 50	15 50	22 50	40 00
Silver-Plated, per doz	17 50	20 00	25 00	35 00	63 00

FINISHED COMPRESSION WASH TRAY BIBBS,

FLANGE AND THIMBLE.

Fig. 206.

Size	⅜	½	⅝	¾	1 in.
Per doz	$15 00	17 00	20 00	28 00	51 00
Nickel-Plated, per doz	18 00	20 50	23 50	32 00	55 00
Silver-Plated, per doz	24 00	28 00	35 00	44 00	79 00

FINISHED COMPRESSION WASH TRAY BIBBS,

STRAIGHT.

Fig. 208.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 9 00	10 00	12 00	18 00	34 00
Nickel-Plated, per doz	11 00	12 50	14 50	20 50	37 00
Silver-Plated, per doz	16 50	19 00	24 00	33 00	60 00

FINISHED COMPRESSION WASH TRAY BIBBS,

STRAIGHT, SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 210.

Size	⅜	½	⅝	¾	1 in.
Per doz	$10 00	11 00	13 00	20 00	37 00
Nickel-Plated, per doz	12 00	13 50	15 50	22 50	40 00
Silver-Plated, per doz	17 50	20 00	25 00	35 00	63 00

FINISHED COMPRESSION WASH TRAY BIBBS,

STRAIGHT, FLANGE AND THIMBLE.

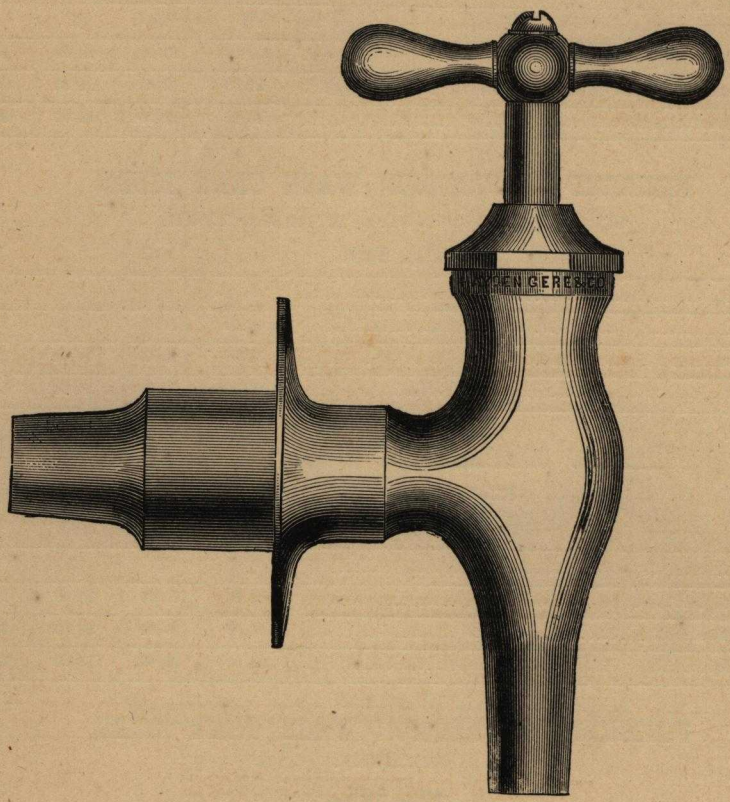
Fig. 211.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 15 00	17 00	20 00	28 00	51 00
Nickel-Plated, per doz	18 00	20 50	23 50	32 00	55 00
Silver-Plated, per doz	24 00	28 00	35 00	44 00	79 00

COMPRESSION BATH BIBBS,

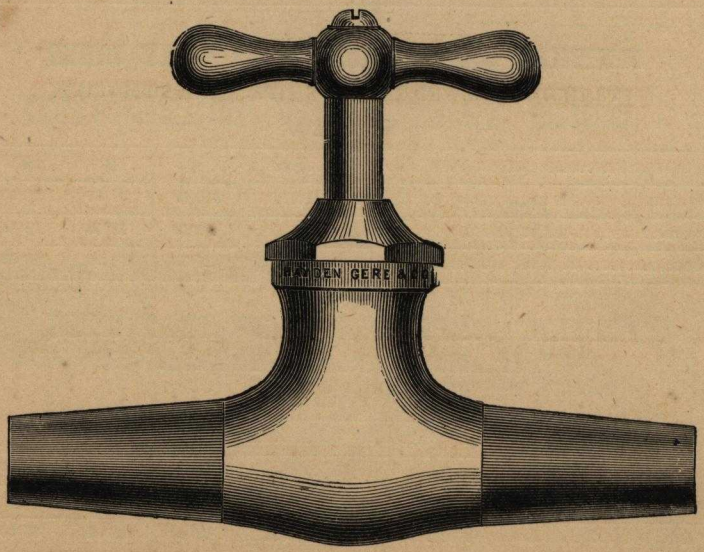
FLANGE AND THIMBLE.

Fig. 216.



COMPRESSION STOPS.

Fig. 219.



FINISHED COMPRESSION BATH BIBBS.

Fig. 213.

Size	½	⅝	¾	1 in.
Per doz	$ 14 00	17 00	26 00	42 00
Nickel-Plated, per doz	16 50	19 50	28 50	45 00
Silver-Plated, per doz	23 00	29 00	41 00	68 00

FINISHED COMPRESSION BATH BIBBS, Screwed for Iron Pipe, with Shoulder.

Fig. 215.

Size	½	⅝	¾	1 in.
Per doz	$ 15 00	18 00	28 00	45 00
Nickel Plated, per doz	17 50	20 50	30 50	48 00
Silver-Plated, per doz	24 00	30 00	43 00	71 00

FINISHED COMPRESSION BATH BIBBS, Flange and Thimble.

Fig. 216.

Size	½	⅝	¾	1
Per doz	$ 21 00	25 00	36 00	59 00
Nickel-Plated, per doz	24 50	28 50	40 00	63 00
Silver-Plated, per doz	32 00	40 00	52 00	87 00

ROUGH COMPRESSION STOPS.

Fig. 218.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 9 50	10 50	12 00	18 50	32 00

FINISHED COMPRESSION STOPS.

Fig. 219.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 10 00	11 00	13 00	19 50	36 00
Nickel-Plated, per doz	12 00	13 50	15 50	22 00	39 00
Silver-Plated, per doz	17 50	20 00	25 00	34 50	52 00

FINISHED COMPRESSION SHOWER BATH COCKS.

Fig. 224.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 12 00	13 50	15 50	22 50	41 00
Nickel-Plated, per doz	14 00	16 00	18 00	25 00	44 00
Silver-Plated, per doz	19 50	22 50	27 50	37 50	67 00

FINISHED COMPRESSION STOPS, with Stuffing Box.

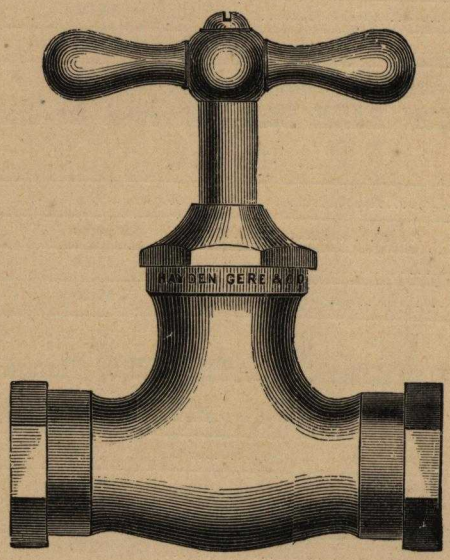
Fig. 459.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 12 00	13 00	15 00	21 50	39 00
Nickel-Plated, per doz	14 00	15 50	17 50	24 00	42 00
Silver-Plated, per doz	19 50	22 00	27 00	36 50	55 00

COMPRESSION STOPS,

SCREWED FOR IRON PIPE.

Fig. 223.



ROUGH COMPRESSION STOPS,

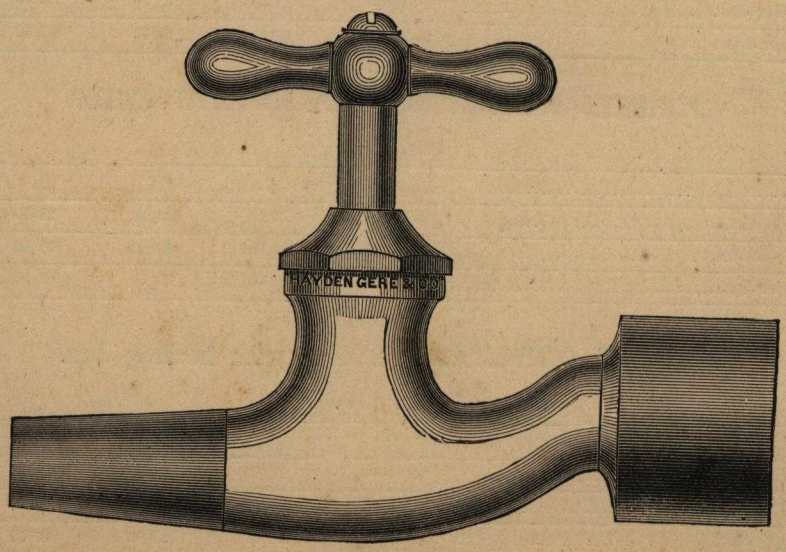
FOR LEAD AND IRON PIPE.

Fig. 220.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 10 00	11 00	12 50	19 50	33 00

COMPRESSION URINAL COCKS.

Fig. 228.



COMPRESSION STOPS---Continued.

FINISHED COMPRESSION STOPS,

FOR LEAD AND IRON PIPE.

Fig. 221.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 10 50	11 50	13 50	20 50	37 00
Nickel-Plated, per doz	12 50	14 00	16 00	23 00	40 00
Silver-Plated, per doz	18 00	20 50	25 50	38 50	53 00

ROUGH COMPRESSION STOPS,

SCREWED FOR IRON PIPE.

Fig. 222.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 10 50	11 50	13 00	20 00	34 00

FINISHED COMPRESSION STOPS,

SCREWED FOR IRON PIPE.

Fig. 223.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 11 00	12 00	14 00	21 00	38 00
Nickel-Plated, per doz	13 00	14 50	16 50	23 50	41 00
Silver-Plated, per doz	18 50	21 00	26 00	38 00	54 00

FINISHED COMPRESSION SHOWER BATH COCKS,

SCREWED FOR IRON PIPE.

Fig. 225.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 13 00	14 50	16 50	24 50	44 00
Nickel-Plated, per doz	15 00	17 00	19 00	27 00	47 00
Silver-Plated, per doz	20 50	23 50	28 50	39 00	70 00

FINISHED COMPRESSION STOPS,

SCREWED FOR IRON PIPE, WITH STUFFING BOX.

Fig. 460.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 13 00	14 00	16 00	23 00	41 00
Nickel-Plated, per doz	15 00	16 50	18 50	25 50	44 00
Silver-Plated, per doz	20 50	23 00	28 00	40 00	57 00

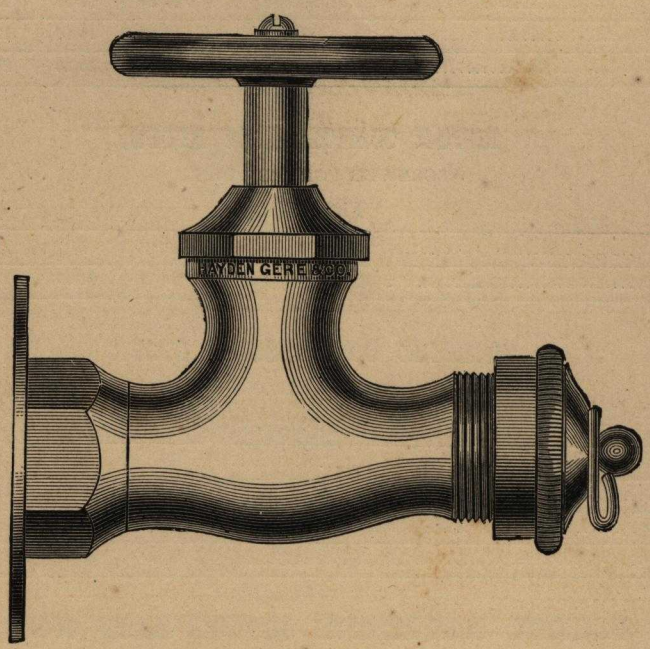
FINISHED COMPRESSION URINAL COCKS.

Fig. 228.

Size	⅜	½ in.
Price, per doz	$ 17 00	18 00
Nickel-Plated, per doz	20 00	21 00
Silver-Plated, per doz	25 00	28 00

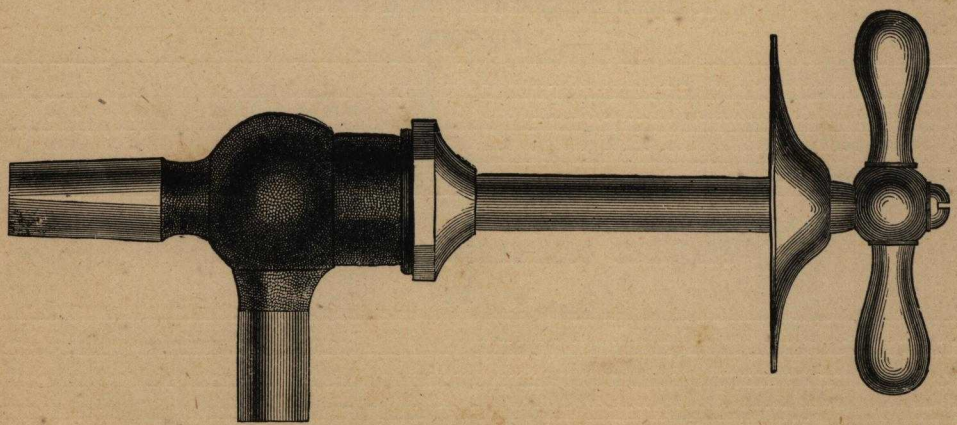
COMPRESSION SILL COCKS.

Fig. 230.



COMPRESSION HOPPER COCKS.

Fig. 232.



FINISHED COMPRESSION SILL COCKS.

Fig. 230.

Size	½	¾ in.
Per doz	$ 18 00	18 00
Nickel-Plated, per doz	21 00	21 00

FINISHED COMPRESSION SILL COCKS.

Fig. 231.

Size	½	¾ in.
Per doz	$ 22 00	22 00
Nickel-Plated, per doz	26 00	26 00

COMPRESSION HOPPER COCKS.

Fig. 232.

Size	½	⅝	¾ in.
Rough, Finished Flange and Handle, per doz.	$ 16 00	19 00	24 00
Rough, Nickel-Plated Flange and Handle, per doz.	18 50	21 50	26 50
Rough, Silver-Plated Flange and Handle, per doz.	25 00	31 00	39 00

COMPRESSION HOPPER COCKS,

SCREWED FOR IRON PIPE.

Fig. 233.

Size	½	⅝	¾ in.
Rough, Finished Flange and Handle, per doz.	$ 17 00	20 00	26 00
Rough, Nickel-Plated Flange and Handle, per doz.	19 50	22 50	28 50
Rough, Silver-Plated Flange and Handle, per doz.	26 00	32 00	41 00

COMPRESSION HOPPER COCKS,

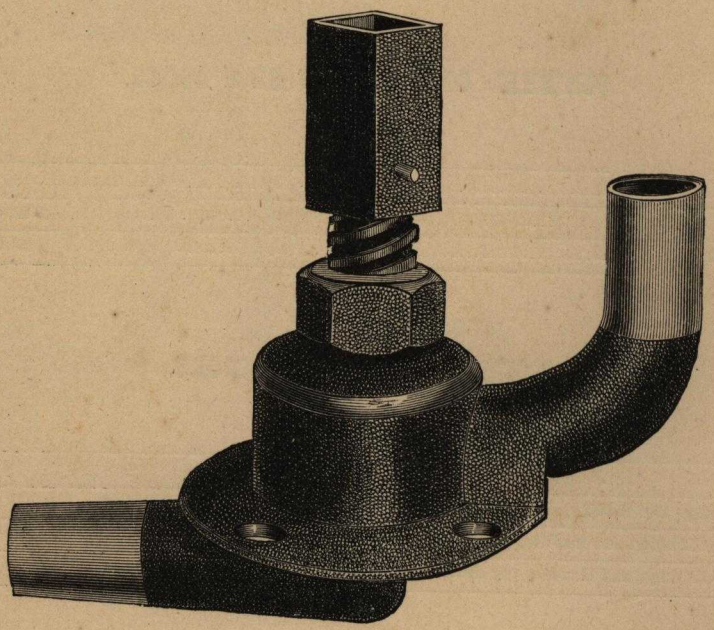
STRAIGHT.

Fig. 234.

Size	½	⅝	¾ in.
Rough, Finished Flange and Handle, per doz.	$ 18 00	21 00	26 00
Rough, Nickel-Plated Flange and Handle, per doz.	20 50	23 50	28 50
Rough, Silver-Plated Flange and Handle, per doz.	27 00	33 00	41 00

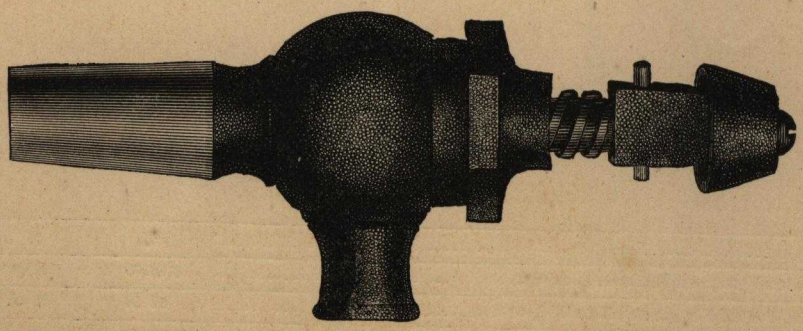
COMPRESSION HYDRANT COCKS.

Fig. 235.



COMPRESSION BALL COCKS.

Fig. 243.



COMPRESSION HYDRANT COCKS.

Fig. 235.

Size	½	⅝	¾ in.
Per doz	$ 18 00	20 00	22 00

COMPRESSION HYDRANT COCKS,

FOR LEAD AND IRON PIPE.

Fig. 236.

Size	½	⅝	¾ in.
Per doz	$ 19 00	21 00	24 00

COMPRESSION HYDRANT COCKS,

SCREWED FOR IRON PIPE.

Fig. 237.

Size	½	⅝	¾ in.
Per doz	$ 20 00	22 00	26 00

COMPRESSION HYDRANT COCKS.

Fig. 241.

Size	½	⅝	¾ in.
Per doz	$ 18 00	20 00	22 00

COMPRESSION HYDRANT COCKS,

FOR IRON PIPE.

Fig. 242.

Size	½	⅝	¾ in.
Per doz	$ 20 00	22 00	26 00

COMPRESSION BALL COCKS.

Fig. 243.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 8 50	9 50	11 00	17 00	30 00

COMPRESSION BALL COCKS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

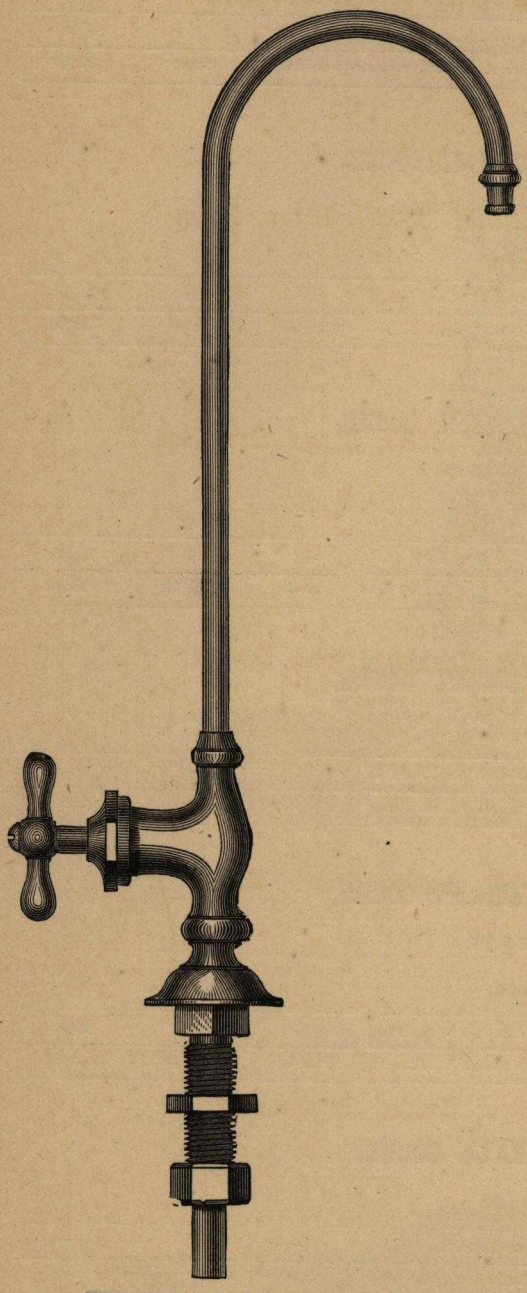
Fig. 245.

Size	⅜	½	⅝	¾	1 in.
Per doz	$ 9 50	10 50	12 00	19 00	33 00

COMPRESSION PANTRY COCKS, | COMPRESSION PANTRY COCKS,

PLAIN.

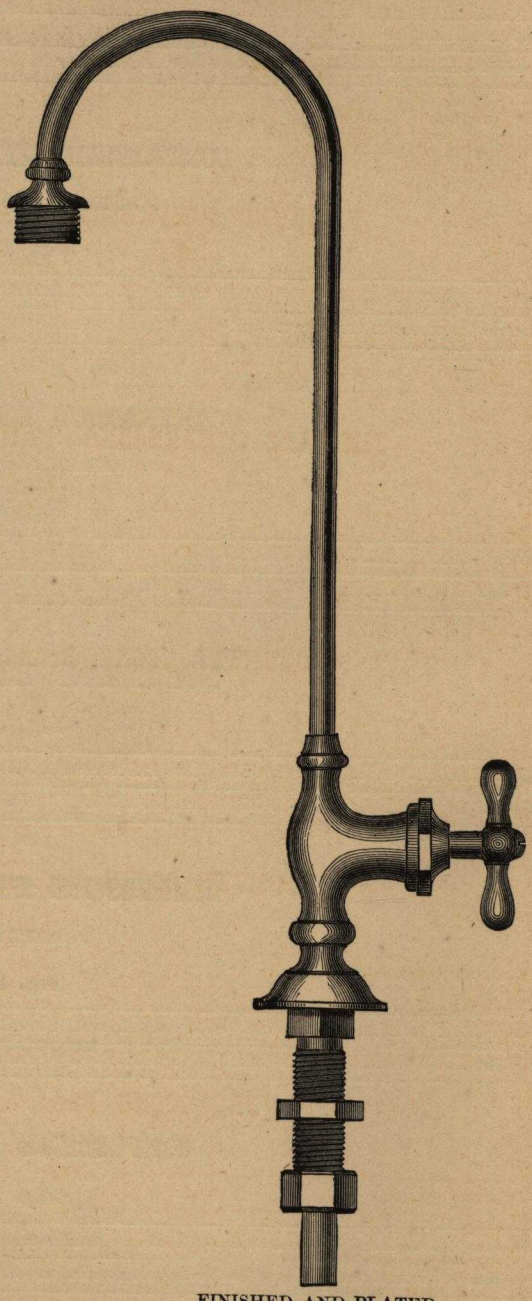
Fig. 247.



FINISHED AND PLATED.

HOSE END.

Fig. 248.



FINISHED AND PLATED.

FINISHED COMPRESSION PANTRY COCKS,

PLAIN.

Fig. 247.

Per doz	$ 24 00
Nickel-Plated, per doz	27 00
Silver-Plated, per doz	34 00

COMPRESSION PANTRY COCKS---Continued.

FINISHED COMPRESSION PANTRY COCKS, Hose End.

Fig. 248.

Per doz	$ 25 00
Nickel-Plated, per doz	28 00
Silver-Plated, per doz	35 00

FINISHED COMPRESSION PANTRY COCKS, Large, Plain.

Fig 249.

Per doz	$ 60 00
Nickel-Plated, per doz	68 00
Silver-Plated, per doz	80 00

FINISHED COMPRESSION PANTRY COCKS, Large, Hose End.

Fig. 250.

Per doz	$ 61 00
Nickel-Plated, per doz	69 00
Silver-Plated, per doz	81 00

COUNTER COCKS, Round, T Handle, Ground Key.

Fig. 156.

Finished, per doz	$ 24 00
Nickel-Plated, per doz	28 00
Silver-Plated, per doz	34 00

COUNTER COCKS, Octagon, T Handle, Ground Key.

Fig. 157.

Finished, per doz	$ 27 00
Nickel-Plated, per doz	31 00
Silver-Plated, per doz	37 00

PANTRY COCKS, Plain, Lever Handle, Ground Key.

Fig. 158.

Description	Small.	Large.
Finished, per doz	$ 24 00	30 00
Nickel-Plated, per doz	28 00	34 00
Silver-Plated, per doz	34 00	40 00

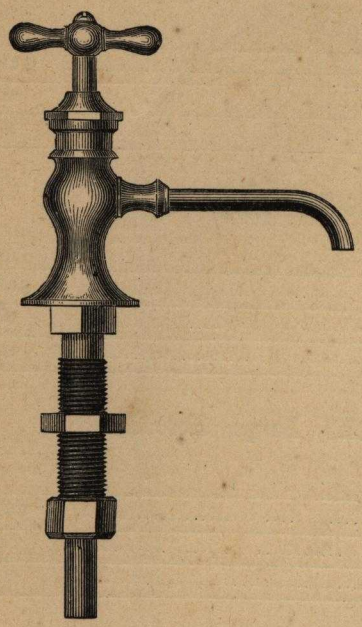
PANTRY COCKS, Hose End, Lever Handle, Ground Key.

Fig. 159.

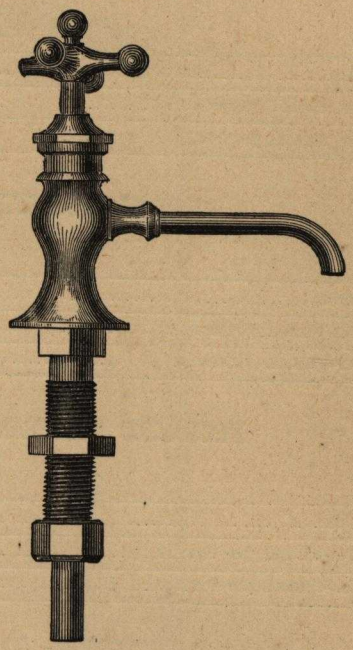
Description	Small.	Large.
Finished, per doz	$ 25 00	31 00
Nickel-Plated, per doz	29 00	35 00
Silver-Plated, per doz	35 00	41 00

COMPRESSION BASIN COCKS.

No. 0. Fig. 251.



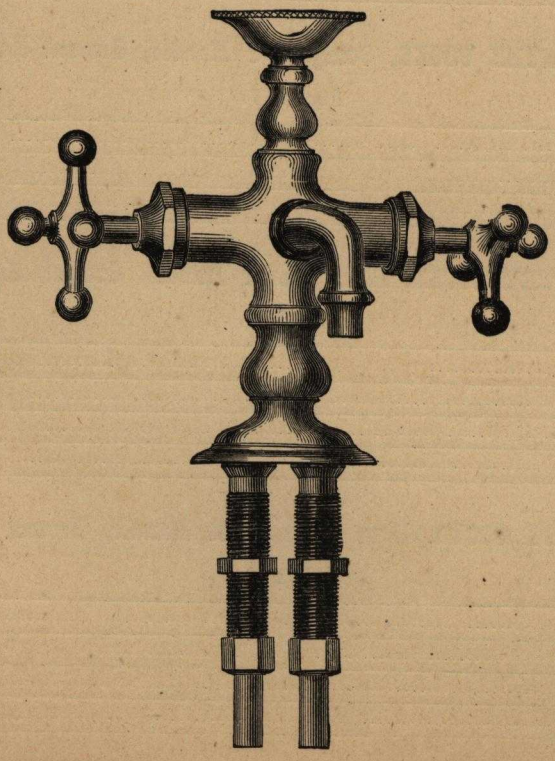
No. 5. Fig. 257.



COMPRESSION DOUBLE BASIN COCKS,

RING CUP.

Fig. 272.



COMPRESSION BASIN COCKS.

Figures	251	252	253	254	255	256	257	258	259	260
Description	0	1	1¼	2	3	4	5	6	7	8
Finished, per doz	$14 00	15 00	16 00	18 00	19 00	19 00	15 00	16 00	17 00	20 00
Nickel-Plated, per doz	17 00	18 00	19 00	21 00	22 00	22 00	18 00	19 00	20 00	23 00
Silver-Plated, per doz	23 00	24 00	25 00	27 00	28 00	28 00	24 00	25 00	26 00	29 00

COMPRESSION BASIN COCKS—*Continued.*

Figures	261	262	263	264	265	266	267	268	269	270
Description	9	10	11	12	13	14	15	16	17	18
Finished, per doz	$19 00	22 00	36 00	48 00	34 00	36 00	24 00	28 00	30 00	32 00
Nickel-Plated, per doz	22 00	25 00	40 00	54 00	38 00	40 00	27 00	31 00	34 00	36 00
Silver-Plated, per doz	28 00	31 00	48 00	64 00	46 00	48 00	34 00	38 00	42 00	44 00

FINISHED COMPRESSION DOUBLE BASIN COCKS,

FOR BACK OF SLAB.

Fig. 271.

Finished, each	$ 5 00
Nickel-Plated, each	5 50
Silver-Plated, per doz	6 50

FINISHED COMPRESSION DOUBLE BASIN COCKS,

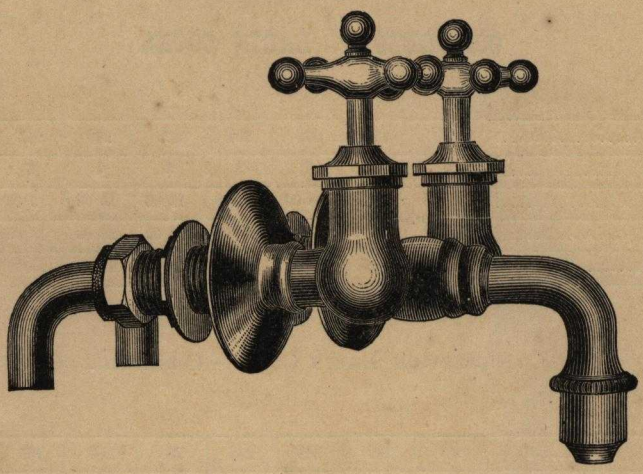
RING CUP.

Fig. 272.

Finished, each	$ 9 00
Nickel-Plated, each	10 00
Silver-Plated, each	11 00

COMPRESSION DOUBLE BATH COCKS.

No. 1. Fig. 275.



Finished Compression Double Bath Cocks,

WITHOUT TUBING.

No. 1. Fig. 275.

Finished, each	$7 50
Nickel-Plated, each	8 00
Silver-Plated, each	9 50

Finished Compression Double Bath Cocks,

WITHOUT TUBING.

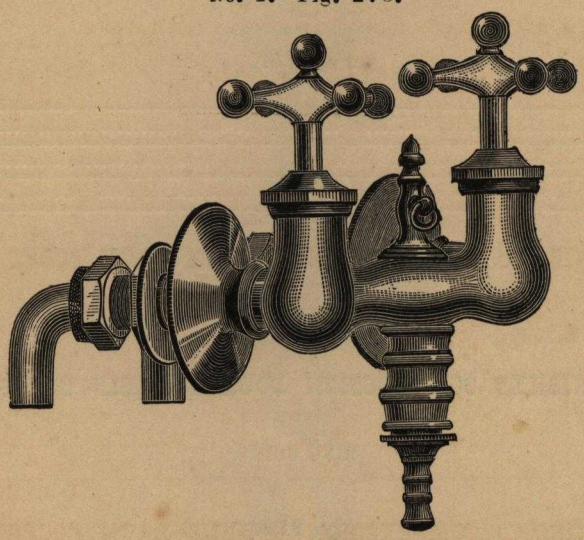
No. 2. Fig. 276.

Finished, each	$6 50
Nickel-Plated, each	7 00
Silver-Plated, each	8 50

COMPRESSION DOUBLE BATH COCKS,

WITH CHAIN STAY.

No. 4. Fig. 278.



Finished Compression Double Bath Cocks,

WITH RING CUP, WITHOUT TUBING.

No. 3. Fig. 277.

Finished, each	$7 50
Nickel-Plated, each	8 00
Silver-Plated, each	9 50

Finished Compression Double Bath Cocks,

WITH CHAIN STAY, WITHOUT TUBING.

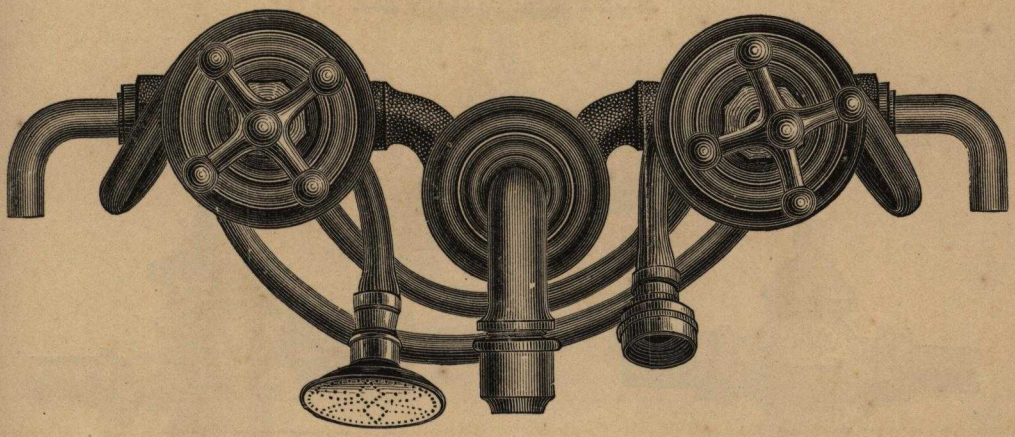
No. 4. Fig. 278.

Finished, each	$7 00
Nickel-Plated, each	7 50
Silver-Plated, each	9 00

COMPRESSION DOUBLE BATH COCKS,

HANDLES IN FRONT.

No. 5. Fig. 279.



FINISHED COMPRESSION DOUBLE BATH COCKS.

HANDLES IN FRONT, WITHOUT TUBING.

No. 5. Fig. 279.

Finished, each	$ 6 50
Nickel-Plated, each	7 00
Silver-Plated, each	8 50

FINISHED COMPRESSION DOUBLE BATH COCKS,

HANDLES IN FRONT, TO SUPPLY AT BOTTOM.

No. 7. Fig. 281.

Finished, each	$ 5 50
Nickel-Plated, each	6 00
Silver-Plated, each	7 50

FINISHED COMPRESSION DOUBLE BATH COCKS,

HANDLES ON TOP, WITHOUT TUBING.

No. 6. Fig. 280.

Finished, each	$ 6 50
Nickel-Plated, each	7 00
Silver-Plated, each	8 50

FINISHED COMPRESSION DOUBLE BATH COCKS,

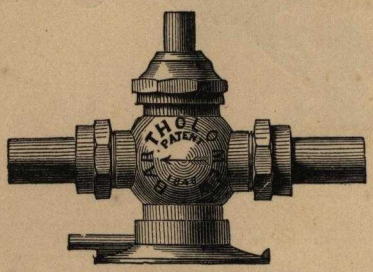
HANDLES ON TOP, TO SUPPLY AT BOTTOM.

No. 8. Fig. 282.

Finished, each	$ 5 50
Nickel-Plated, each	6 00
Silver-Plated, each	7 50

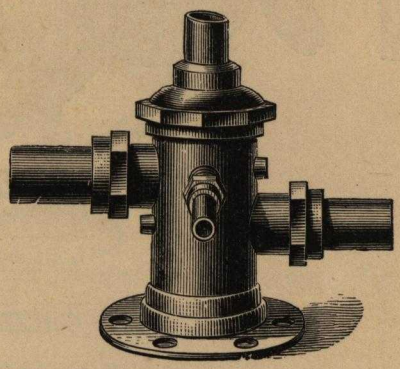
HOPPER VALVES.

Bartholomew's Single.



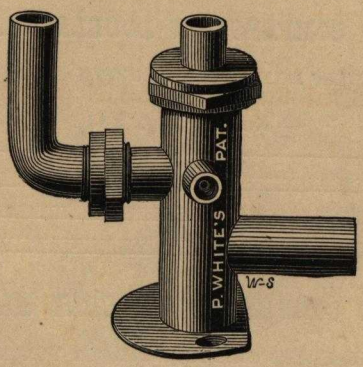
Runs when Sat Upon.

Bartholomew's Double



Runs when Relieved of Weight.

White's Patent.



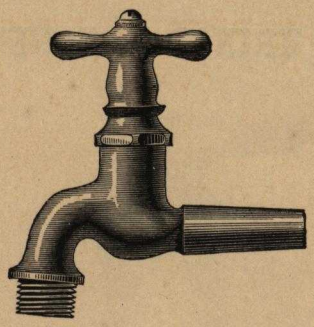
This Valve has no coupling on inlet, and does not require to be set in Safe Pan; can be repaired without breaking a joint; wastes perfectly. Guaranteed to give satisfaction in all kinds of water or under any pressure.

HOPPER VALVES.

Bartholomew's Single, per doz	$ 20 00
Bartholomew's Double, per doz	36 00
White's Patent Hopper Valve, per doz	30 00

ZANE'S SELF-CLOSING BIBBS AND COCKS,

PATENTED.



SELF-CLOSING PLAIN BIBBS,

FOR LEAD PIPE.

Size	⅜	½	⅝	1 in.
Finished, per doz	$ 21 00	24 00	27 00	72 00
Nickel-Plated, per doz	36 00	39 00	42 00	
Silver-Plated, per doz	39 00	42 00	51 00	

SELF-CLOSING PLAIN BIBBS,

FLANGE AND THIMBLE.

Size	½	⅝ in.
Finished, per doz	$ 36 00	39 00
Nickel-Plated, per doz	51 00	54 00
Silver-Plated, per doz	54 00	63 00

SELF-CLOSING PLAIN BIBBS,

FOR IRON PIPE.

Size	⅜	½	¾	1 in.
Rough, per doz		$ 25 00		
Finished, per doz	$ 25 00	28 00	31 00	78 00
Nickel-Plated, per doz	40 00	43 00	46 00	
Silver-Plated, per doz	43 00	46 00	55 00	

SELF-CLOSING HOSE BIBBS,

FOR LEAD PIPE.

Size	½	⅝ in.
Finished, per doz	$ 27 00	30 00
Nickel-Plated, per doz	42 00	45 00
Silver-Plated, per doz	45 00	54 00

SELF-CLOSING HOSE BIBBS,

FOR IRON PIPE.

Size	½	¾ in.
Finished, per doz	$ 31 00	34 00
Nickel-Plated, per doz	46 00	49 00
Silver-Plated, per doz	49 00	58 00

SELF-CLOSING STOP COCKS,

FOR LEAD PIPE.

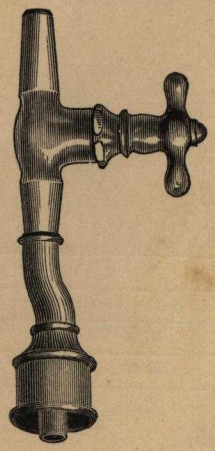
Size	½	⅝ in.
Finished, per doz	$ 24 00	27 00
Nickel-Plated, per doz	39 00	42 00
Silver-Plated, per doz	42 00	51 00

SELF-CLOSING STOP COCKS,

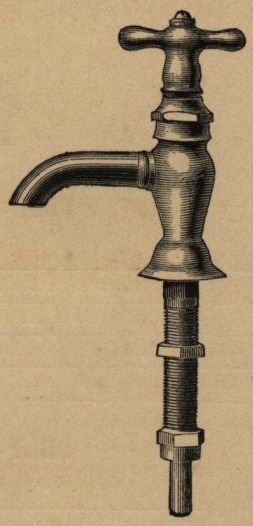
FOR IRON PIPE, BOTH ENDS.

Size	½	¾ in.
Finished, per doz	$ 32 00	35 00
Nickel-Plated, per doz	47 00	50 00
Silver-Plated, per doz	50 00	59 00

ZANE'S SELF-CLOSING URINAL STOP COCKS.



ZANE'S SELF-CLOSING BASIN COCKS.



ZANE'S SELF-CLOSING URINAL STOP COCKS.

Size	½ in.
Finished, for Lead Pipe, per doz	$ 36 00
Nickel-Plated, for Lead Pipe, per doz	48 00
Silver-Plated, for Lead Pipe, per doz	60 00
Finished, for Iron Pipe, per doz	40 00
Nickel-Plated, for Iron Pipe, per doz	52 00
Silver-Plated, for Iron Pipe, per doz	64 00

ZANE'S SELF-CLOSING HOPPER COCKS,

FINISHED FLANGE AND HANDLE.

Size	⅝ in.
For Lead Pipe, per doz	$ 30 00
For ½-in. Iron Pipe, One End, per doz	34 00

ZANE'S SELF-CLOSING BASIN COCKS,

Finished, per doz	$ 45 00
Nickel-Plated, per doz	48 00
Silver-Plated, per doz	60 00

SELF-CLOSING PANTRY COCKS,

SMALL.

Finished, per doz	$ 54 00
Nickel-Plated, per doz	64 00
Silver-Plated, per doz	72 00
Hose Ends, extra, per doz	3 00

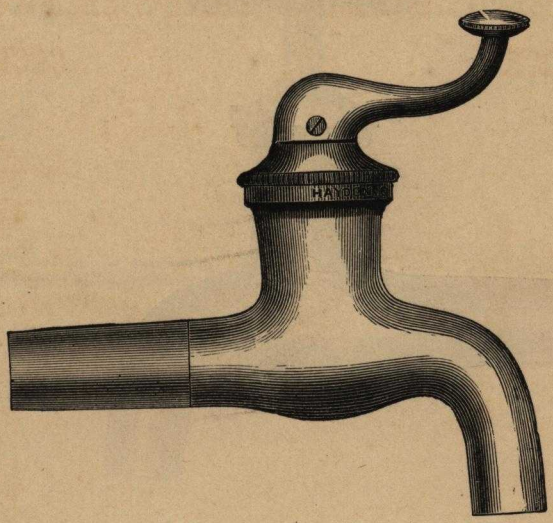
SELF-CLOSING PANTRY COCKS,

LARGE.

Finished, Hose or Plain Ends, per doz	$ 84 00
Nickel-Plated, per doz	100 00
Silver-Plated, per doz	108 00

TELEGRAPH PLAIN BIBBS.

Fig. 300.



FINISHED TELEGRAPH PLAIN BIBBS.

Fig. 300.

Size	⅜	½	⅝	¾ in.
Finished, per doz	$ 15 00	17 00	20 00	24 00
Nickel-Plated, per doz	17 00	19 50	22 50	26 50
Silver-Plated, per doz	22 50	26 00	32 00	39 00

FINISHED TELEGRAPH PLAIN BIBBS,

SCREWED FOR IRON PIPE, WITH SHOULDER.

Fig. 301.

Size	⅜	½	⅝	¾ in.
Finished, per doz	$ 16 00	18 00	21 00	26 00
Nickel-Plated, per doz	18 00	20 50	23 50	28 50
Silver-Plated, per doz	23 50	27 00	33 00	41 00

FINISHED TELEGRAPH PLAIN BIBBS,

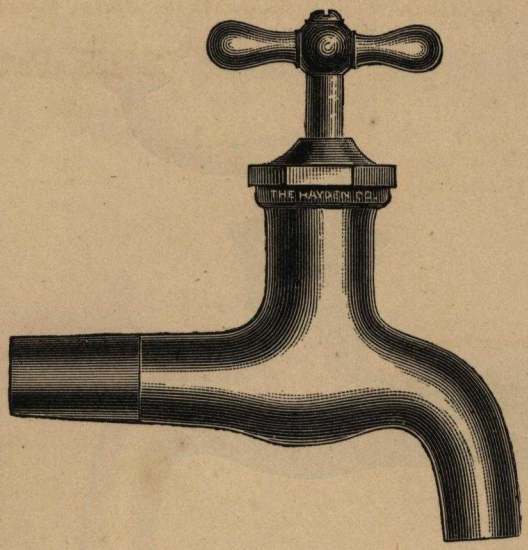
FLANGE AND THIMBLE.

Fig. 302.

Size	⅜	½	⅝	¾ in.
Finished, per doz	$ 21 00	24 00	28 00	34 00
Nickel-Plated, per doz	24 00	27 50	31 50	38 00
Silver-Plated, per doz	30 00	35 00	43 00	50 00

SOFFE'S SELF-CLOSING BIBBS AND COCKS,

PATENTED.



PLAIN BIBBS, For Lead Pipe.

Size	⅜	½	⅝	¾ in.
Brass, per doz	$ 15 00	18 00	21 00	24 00
Plated, per doz	24 00	30 00	33 00	36 00

PLAIN BIBBS, For Iron Pipe.

Size	⅜	½	¾ in.
Brass, per doz	$ 21 00	24 00	30 00

PLAIN BIBBS, Flange and Thimble.

Size	⅜	½	⅝	¾ in.
Brass, per doz	$ 21 00	24 00	27 00	30 00
Plated, per doz	30 00	36 00	39 00	45 00

HOSE BIBBS.

Size	⅜	½	⅝	¾ in.
Brass, per doz	$ 18 00	21 00	24 00	27 00
Plated, per doz	30 00	33 00	36 00	39 00

HOSE BIBBS, For Iron Pipe.

Size	⅜	½	¾ in.
Brass, per doz	$ 24 00	27 00	33 00

STOP COCKS, For Lead Pipe.

Size	⅜	½	⅝	¾ in.
Brass, per doz	$ 15 00	18 00	21 00	24 00

STOP COCKS, One End for Iron Pipe.

Size	½	¾ in.
Brass, per doz	$ 21 00	27 00

STOP COCKS, Both Ends for Iron Pipe.

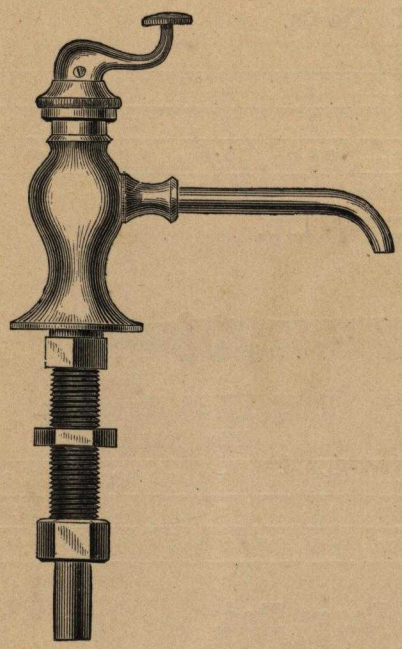
Size	½	¾ in.
Brass, per doz	$ 24 00	30 00

URINAL COCKS.

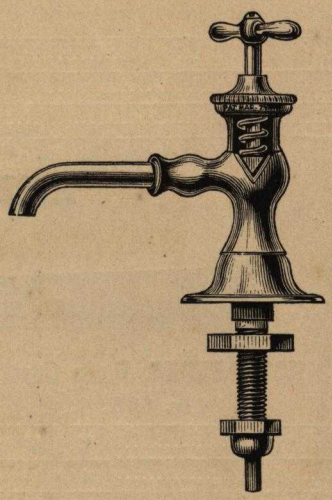
Size	½	⅝ in.
Brass, per doz	$ 24 00	27 00
Plated, per doz	36 00	42 00

TELEGRAPH BASIN COCKS.

Fig. 295.



SOFFE'S SELF-CLOSING BASIN COCKS, Patented.



FINISHED TELEGRAPH BASIN COCKS.

Fig. 295.

Finished, per doz	$ 24 00
Nickel-Plated, per doz	27 00
Silver-Plated, per doz	33 00

SOFFE'S SELF-CLOSING BASIN COCKS.

Brass, per doz	$ 24 00
Nickel-Plated, per doz	30 00
Silver-Plated, per doz	36 00

SOFFE'S SELF-CLOSING PANTRY COCKS.

Brass, per doz	$ 42 00
Nickel-Plated, per doz	54 00
Silver-Plated, per doz	60 00

HOSE NOZZLES, To Tie On.

Fig. 305.

HOSE NOZZLES, To Tie On.

Fig. 305.

Size	¾	¾	1	1	1 in.
Length	6	10	6	8	10 in.
Per doz	$ 3 50	5 00	4 50	5 00	6 00

HOSE PIPES, Screw Tip.

Fig. 307.

HOSE PIPES, Plain Cast.

Fig. 306.

Size	¾	¾	1	1 in.
Length	8	12	8	12 in.
Per doz	$ 6 50	8 50	8 50	11 50

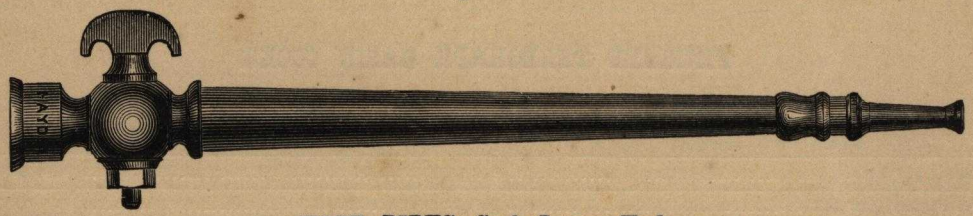
HOSE PIPES, Screw Tip.

Fig. 307.

Size	¾	¾	1	1	1¼	1½	2	2½ in.
Length	8	12	8	12	15	18	21	24 in.
Per doz	$ 7 00	9 00	9 00	12 00	21 00	38 00	60 00	115 00

HOSE PIPES, Cock Large End.

Fig. 309.



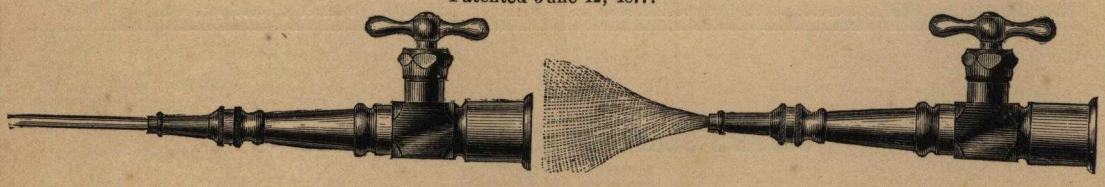
HOSE PIPES, Cock Large End.

Fig. 310.

Size	¾	¾	1	1	1¼	1½	2 in.
Length	8	12	8	12	15	18	24 in.
Per doz	$ 12 00	15 00	14 00	18 00	34 00	72 00	136 00

FULLER HOSE PIPES.

Patented June 12, 1877.



FULLER HOSE PIPES.

Size	¾	1 in.
Per doz	$ 18 00	30 00

It throws a solid stream or spray.

HOSE PIPES—Continued.

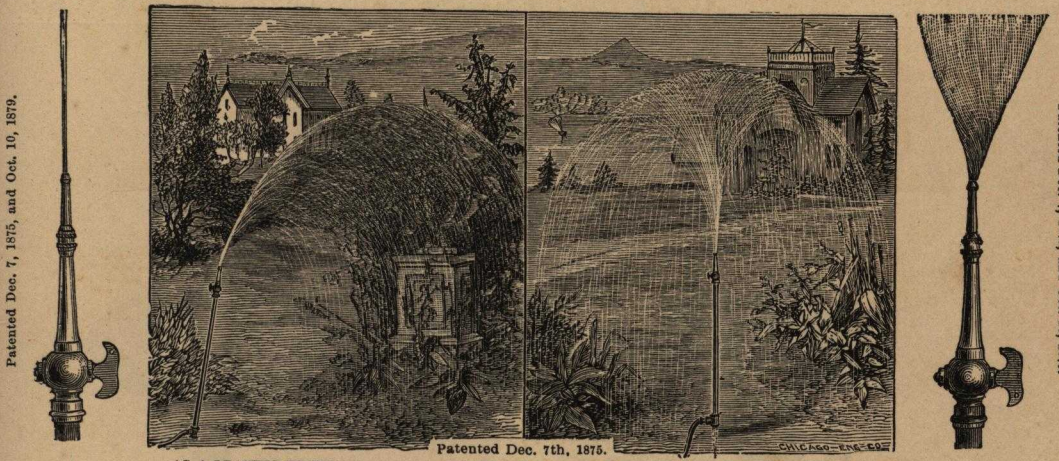
COMPRESSION HOSE PIPES,

COCK LARGE END.

Fig. 312.

Size	¾	1 in.
Per doz	$15 00	20 00

THE IMPROVED MAGIC HOSE NOZZLES.



AS A LEANING FOUNTAIN its position can be changed without turning off the water.

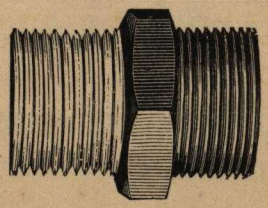
AS A VERTICAL FOUNTAIN its scope is from 300 to 500 square feet area.

THE IMPROVED MAGIC HOSE NOZZLES.

¾ inch Magic Hose Nozzle, Long, with Screw Tip, per doz	$12 00
¾ inch Magic Hose Nozzle, Short, no Screw Tip, per doz	10 00
1 inch Magic Hose Nozzle, Screw Tip, per doz	18 00
Fountain Stand, to stick in ground, as shown in above cut, each	1 50

HOSE NIPPLES.

Fig. 353.



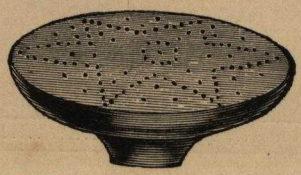
HOSE NIPPLES.

Fig. 353.

Size	¾	1	1¼	1½	2	2½	3	3½	4 in.
Per doz	$3 50	5 00	7 00	10 00	14 00	28 00	40 00	60 00	90 00

HOSE SPRINKLERS.

Fig. 316.

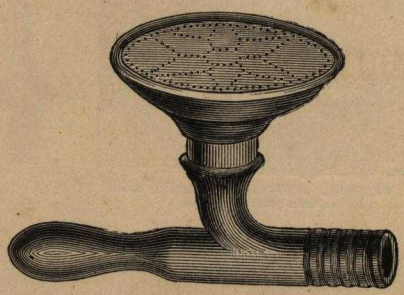


Diameter	1½	2	2½	3	3½	4 in.
Per doz	$ 2 50	3 25	4 25	6 00	12 00	18 00

SHAMPOOING SPRINKLERS,

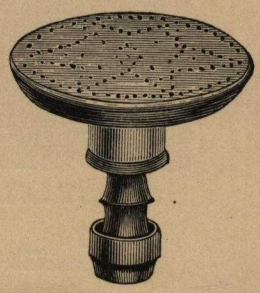
WITH HANDLE.

Fig. 317.



PLAIN.

Fig. 318.



SHAMPOOING SPRINKLERS,

WITH HANDLE.

Fig. 317.

Finished, per doz	$ 13 00
Nickel-Plated, per doz	15 00
Silver-Plated, per doz	18 00

SHAMPOOING SPRINKLERS,

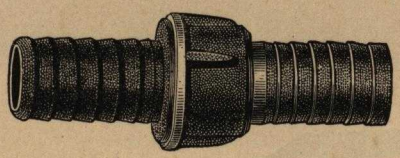
PLAIN.

Fig. 318.

Finished, per doz	$ 8 00
Nickel-Plated, per doz	10 00
Silver-Plated, per doz	12 00

HOSE COUPLINGS.

Fig. 319.



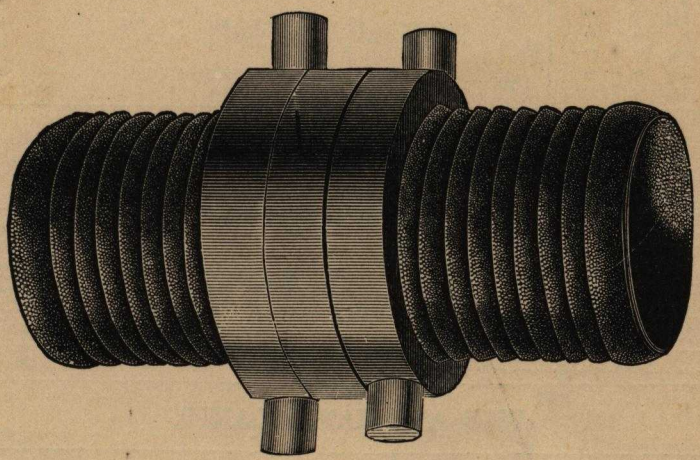
HOSE COUPLINGS.

Fig. 319.

Size	½	¾	1	1¼	1½	2	2½ in.
Per doz	$ 2 40	2 40	4 40	10 00	14 00	24 00	40 00

SUCTION HOSE COUPLINGS.

Fig. 320.

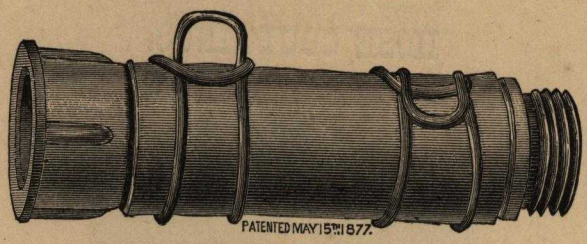


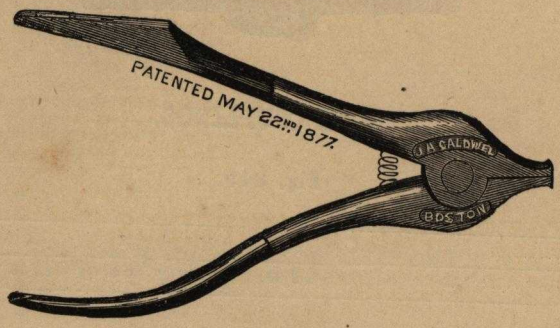
SUCTION HOSE COUPLINGS.

Fig. 320.

Size	2½	3	3½	4 in.
Per doz	$ 48 00	84 00	136 00	172 00

BOSTON PATENT HOSE STRAPS.





PATENT HOSE STRAPS,

THE CHEAPEST, SIMPLEST AND BEST IN USE.

PRICES.

No. 2,	½	inch,	3¾	inch	long,	40c.	per doz.
" 4,	⅝	"	3¾	"	"		
" 6,	¾	"	4⅛	"	"	60c.	"
" 8,	¾	"	4¾	"	"		
" 10,	1	"	5	"	"	80c.	"
" 12,	1	"	5⅜	"	"		
" 14,	1¼	"	6	"	"	$1.00	"
" 16,	1¼	"	6⅜	"	"		
" 18,	1½	"	6¾	"	"	1 20	"
" 20,	1½	"	7⅛	"	"		

No. 22,	1¾	inch,	7⅛	inch	long,	$1 40	per doz.
" 24,	1¾	"	8	"	"		
" 26,	2	"	8½	"	"	1 60	"
" 28,	2	"	9	"	"		
" 30,	2¼	"	9½	"	"	1 80	"
" 32,	2¼	"	10	"	"		
" 34,	2½	"	10½	"	"	2 00	"
" 36,	2½	"	11	"	"		

HOSE STRAP FASTENERS.

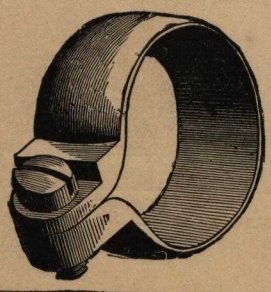
⅛ to 1 inch	50c.
1¼ to 2½ inch	75c.

EARLE'S HOSE BANDS.

Size	⅛	¾	1	1¼	1½	2	2½ in.
Per doz	.40	.60	.80	$ 1 00	1 20	1 60	2 00

VISE AND HAND CLAMPS.

Vise Clamps, ⅛ to 1 inch, inclusive, per doz	$ 12 00
Hand Clamps, per doz	15 00

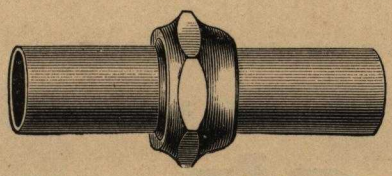


BOLT HOSE CLAMPS.

Size	¾	1	1¼	1½	2 in.
Per doz	$ 1 50	2 00	2 50	3 00	4 00

PLAIN COUPLINGS.

Fig. 326.



PLAIN COUPLINGS,

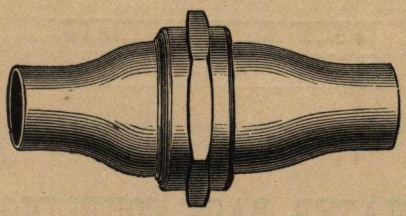
FOR LEAD PIPE.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2	2½	3 in.
Plain Finished, per doz	$ 2 25	2 50	3 50	4 50	5 50	8 00	11 00	18 00	28 00	30 00	40 00	65 00
Finished, Ground Face, per doz			5 00	6 00	6 50	10 00	14 00	22 00	33 00	36 00	48 00	75 00

VALVE COUPLINGS,

GROUND VALVE.

Fig. 327.



VALVE COUPLINGS,

GROUND VALVE, FOR LEAD PIPE.

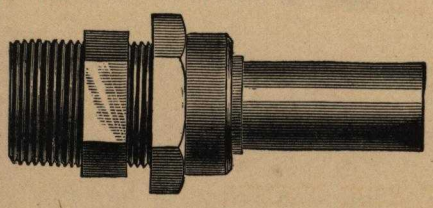
Fig. 327.

Size	½	⅝	¾	1	1¼	1½	1¾	2	2½ in.
Finished, per doz	$ 9 00	10 00	11 00	16 00	22 00	28 00	40 00	48 00	60 00

BOILER COUPLINGS,

STRAIGHT, FOR IRON BOILER.

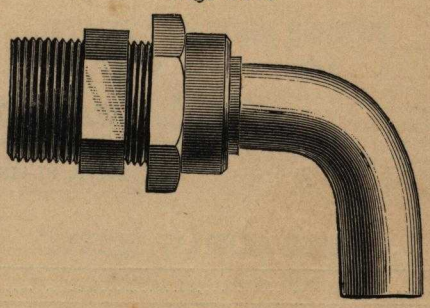
Fig. 331.



BOILER COUPLINGS,

BENT, FOR IRON BOILER.

Fig. 332.

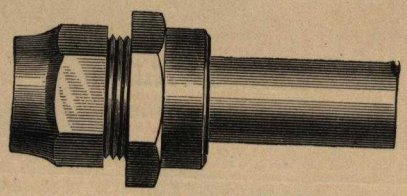


Size	¾ in.
Price per Set of One Straight and Three Bent, Ground Face	$ 2 75

WATER BACK COUPLINGS,

STRAIGHT, PLAIN AND GROUND FACE.

Fig. 333.



WATER BACK COUPLINGS,

STRAIGHT, PLAIN AND GROUND FACE.

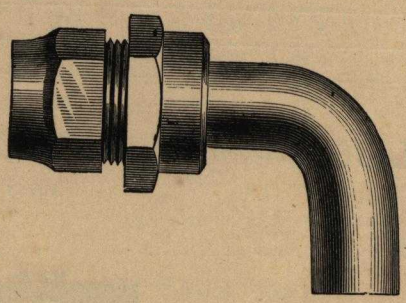
Fig. 333.

Size	½	¾	1 in.
Plain Face, per doz	$ 6 50	7 50	11 00
Ground Face, per doz	7 00	8 00	12 00

WATER BACK COUPLINGS,

BENT, PLAIN AND GROUND FACE.

Fig. 334.



WATER BACK COUPLINGS,

BENT, PLAIN AND GROUND FACE.

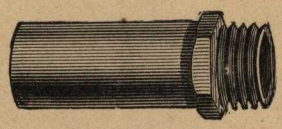
Fig. 334.

Size	½	¾	1 in.
Plain Face, per doz	$ 7 50	8 50	12 00
Ground Face, per doz	8 00	9 00	13 00

SOLDERING NIPPLES,

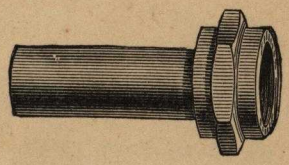
SCREWED OUTSIDE.

Fig. 335.



SOLDERING UNIONS.

Fig. 337.



SOLDERING NIPPLES,

SCREWED OUTSIDE.

Fig. 335.

Size	¼	⅜	½	¾	1	1¼	1½	2 in.
Per doz	$ 1 75	2 25	2 50	3 00	5 00	7 50	10 00	14 00

SOLDERING UNIONS.

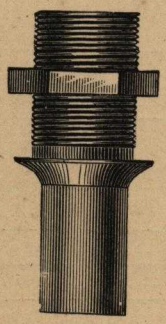
Fig. 337.

Size	¼	⅜	½	¾	1	1¼	1½	2 in.
Per doz	$ 2 25	2 75	3 00	3 50	5 75	8 50	11 00	16 00

STREET WASHER SCREWS,

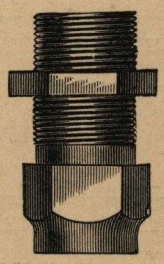
SHORT.

Fig. 343.



SHORT, FOR IRON PIPE.

Fig. 345.



STREET WASHER SCREWS,

SHORT.

Fig. 343.

Size	½	¾	1 in.
Per doz	$ 4 50	5 00	6 00

STREET WASHER SCREWS,

SHORT, FOR IRON PIPE.

Fig. 345.

Size	½	¾	1 in.
Per doz	5 00	5 50	6 50

STREET WASHER SCREWS,

LONG.

Fig. 344.

Size	½	¾	1 in.
Per doz	$ 5 50	6 00	8 50

STREET WASHER SCREWS,

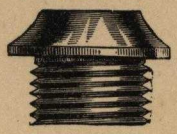
LONG, FOR IRON PIPE.

Fig. 346.

Size	½	¾	1 in.
Per doz	$ 6 00	7 00	9 00

HOSE BIBB ENDS.

Fig. 352.



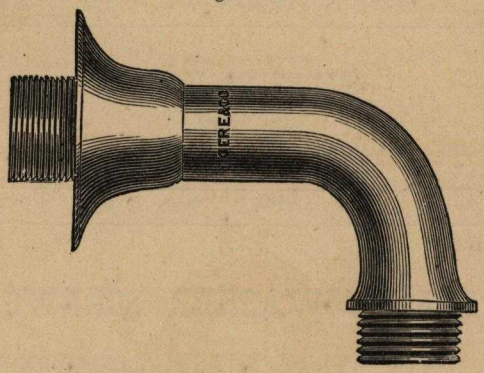
HOSE BIBB ENDS.

Fig. 352.

Size	½	⅝	¾	1	1¼	1½	2 in.
Per doz	$ 2 00	2 00	2 00	3 00	6 00	8 00	15 00

HYDRANT NOZZLES, For Iron Pipe.

Fig. 356.



HYDRANT NOZZLES, For Lead Pipe.

Fig. 355.

Size	½	¾	1 in.
Per doz	$ 4 00	5 00	6 50

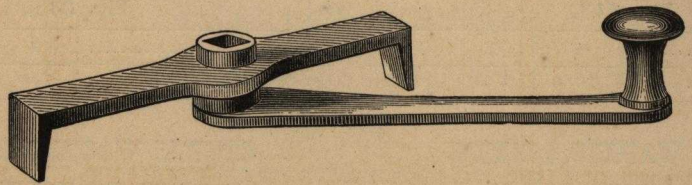
HYDRANT NOZZLES, For Iron Pipe.

Fig. 356.

Size	½	¾	1 in.
Per doz	$ 5 00	6 00	7 50

HYDRANT HANDLES AND GUIDE.

Fig. 357.



HYDRANT HANDLES AND GUIDE.

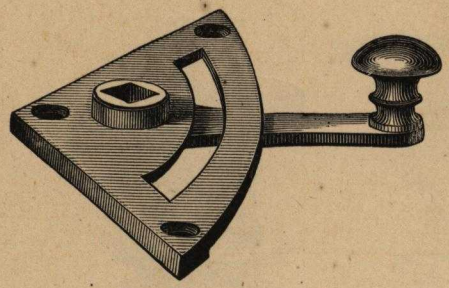
Fig. 357.

Straight, per doz	$ 6 00

HYDRANT HANDLES,

TRIANGULAR GUIDE

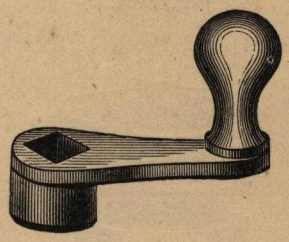
Fig. 358.



HYDRANT HANDLES,

FOR COMPRESSION COCKS.

Fig. 359.



HYDRANT HANDLES,

TRIANGULAR GUIDE.

Fig. 358.

Triangle, per doz	$ 7 00

HYDRANT HANDLES,

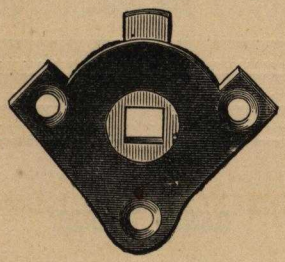
FOR COMPRESSION COCKS.

Fig. 359.

Per doz	$ 5 00

STREET WASHER CHECKS.

Fig. 360.



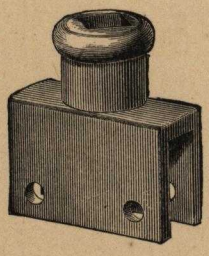
STREET WASHER CHECKS.

Fig. 360.

Per doz	$ 2 50

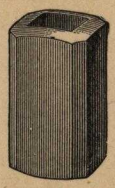
HYDRANT CLAMPS.

Fig. 361.



HYDRANT SOCKETS.

Fig. 362.



HYDRANT CLAMPS.

Fig. 361.

For ½ and ⅝ Cocks, per doz	$ 2 50
For ¾ and 1 inch Cocks, per doz	3 50

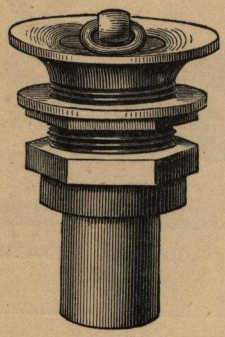
HYDRANT SOCKETS.

Fig. 362.

Per doz	$ 1 75

BASIN PLUGS.

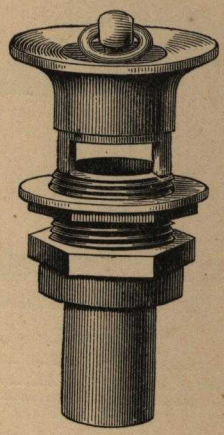
Fig. 363.



BASIN PLUGS,

PATENT OVERFLOW.

Fig. 364.



BASIN PLUGS.

Fig. 363.

Finished, per doz	$6 50
Nickel-Plated, per doz	7 00
Silver-Plated, per doz	8 00

BASIN PLUGS,

PATENT OVERFLOW.

Fig. 364.

Finished, per doz	$7 50
Nickel-Plated, per doz	8 00
Silver-Plated, per doz	9 00

SINK OR BATH PLUGS.

Fig. 369.

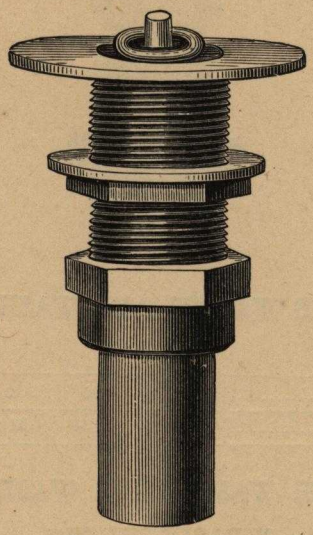
SINK OR BATH PLUGS.

Fig. 369.

Size	1	1¼	1½	1¾	2	2¼	2½	3	4 in.
Finished, per doz	$2 50	3 50	4 50	6 00	8 00	11 00	15 00	18 00	36 00

BUTLER'S SINK PLUGS.

Fig. 367.



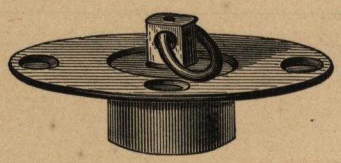
BUTLER'S SINK PLUGS.

Fig. 367.

Size	1	1¼	1½ in.
Finished, per doz	$ 13 00	15 00	19 00
Nickel-Plated, per doz	14 00	16 00	20 00
Silver-Plated, per doz	16 00	18 00	23 00

WASH TRAY PLUGS.

Fig. 370.



TRAP SCREWS.

Fig. 372.

WASH TRAY PLUGS.

Fig. 370.

Size	1	1¼	1½	1¾	2	2¼	2½	3½	4 in.
Per doz	$ 3 50	5 00	6 50	7 50	9 00	13 00	17 00	22 00	44 00

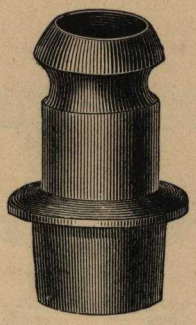
TRAP SCREWS.

Fig. 372.

Size	¾	1	1¼	1½	2	2½	3	3½	4 in.
Per doz	$ 2 50	2 75	3 50	4 50	7 00	11 00	15 00	26 00	30 00

BATH WASTES AND WASHERS.

Fig. 377.



BATH WASTES AND WASHERS.

Fig. 377.

Size	1¼	1½	2	2½	3	3½	4 in.
Per doz	$ 7 50	10 50	14 00	20 00	30 00	44 00	56 00

BATH WASTES AND WASHERS,

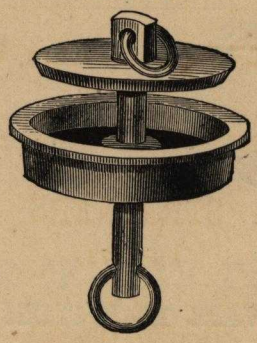
WITH STANDING PIPE.

Fig. 376.

Size	1	1¼	1½ in.
Finished, per doz	$ 30 00	36 00	42 00
Nickel-Plated, per doz	34 00	40 00	46 00
Silver-Plated, per doz	38 00	44 00	50 00

BATH VALVES.

Fig. 386.



BATH VALVES.

Fig. 386.

Size	1½
Per doz	$8 00

BATH VALVES.

Fig. 385.

Size	¾	1	1¼ in.
Per doz	$ 8 00	12 00	16 00

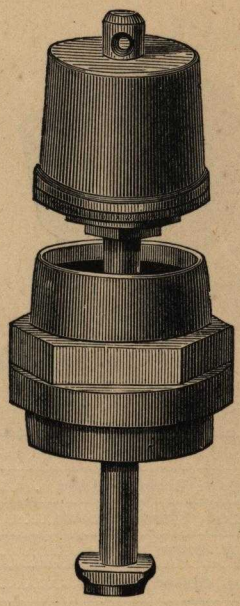
CLOSET VALVES.

Fig. 387.

CLOSET VALVES,

NEW PATTERN.

Fig. 388.



CLOSET VALVES

Fig. 387.

Per doz	$12 00

CLOSET VALVES, New Pattern.

Fig. 388.

Per doz	$23 00

CLOSET VALVES, New Pattern, with Air Tube.

Fig. 389.

Per doz	$24 00

STRAINERS.

Fig. 373.

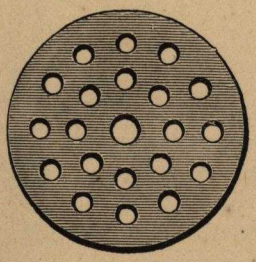


Fig. 374.

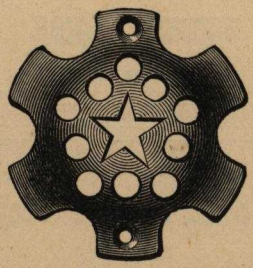
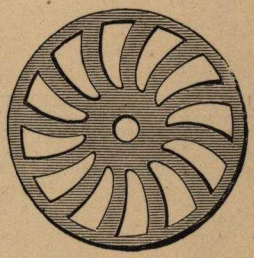


Fig. 375.



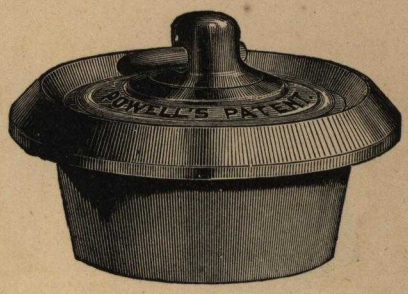
STRAINERS, Round, Convex and Fancy.

Size	1¼	1½	2	2½	3	3½	4	5	6 in.
Per doz	$ 75	85	1 00	1 25	1 50	2 25	3 00	5 00	7 50

PAT. "STAR" BASIN, BATH, SINK AND WASH TRAY PLUGS,

WITH RUBBER STOPPERS.

Rubber Plug.



Sink Plug.

PATENT "STAR" BASIN PLUGS,

WITH RUBBER STOPPERS.

Size	1	1¼
Common Overflow, Brass, per doz	$ 5 50	9 50
Common Overflow, Plated, per doz	7 00	12 00
Patent Overflow, Brass, per doz	7 00	11 00
Patent Overflow, Plated, per doz	8 50	13 50

PATENT "STAR" SINK OR BATH PLUGS,

WITH RUBBER STOPPERS.

Size	1	1¼	1½	2 in.
Brass, per doz	$ 3 50	4 25	5 50	7 00
Plated, per doz	4 50	5 50	7 00	9 00

PATENT "STAR" WASH TRAY PLUGS,

WITH RUBBER STOPPERS.

Size	1	1¼	1½	2 in.
Brass, per doz	$ 4 20	5 00	7 00	12 00
Plated, per doz	5 50	6 50	8 75	15 00

RUBBER PLUGS,

FOR WASH BASINS.

Per doz	$ 3 00

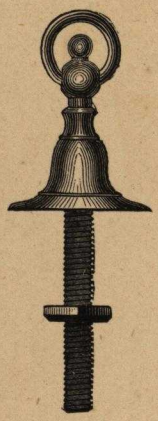
LARGE SIZE RUBBER STOPPERS,

FOR BATH TUBS, SINKS, ETC.

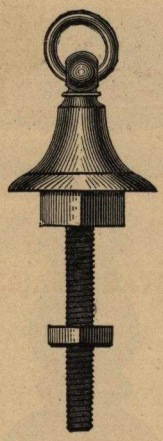
Size	1¼	1½	2 in.
With Brass Tips and Rings, per doz	$ 4 00	4 50	5 25
With Plated Tips and Rings, per doz	4 50	5 25	6 00

CHAIN STAYS.

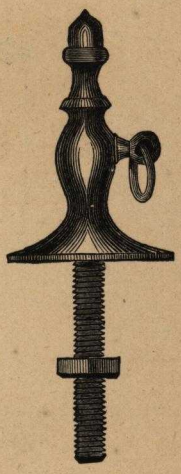
No. 2. Fig. 398.



No. 3. Fig. 399.



No. 6. Fig. 402.



CHAIN STAYS.

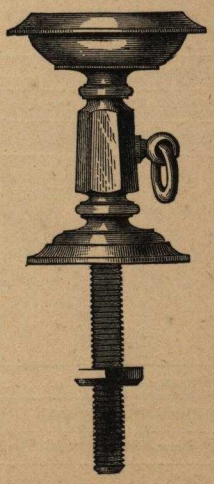
Figures	397	398	399	400	401	402	403
Description	1	2	3	4	5	6	7
Finished, per doz	$ 2 25	3 25	6 00	4 00	4 50	8 00	15 00
Nickel-Plated, per doz	2 75	4 00	7 00	4 75	5 50	9 00	17 00
Silver-Plated, per doz	3 25	4 50	8 00	5 25	6 50	10 00	19 00

CHAIN STAYS,

WITH RING CUP.

No. 8. Fig. 404.

No. 9. Fig. 405.



CHAIN STAYS,

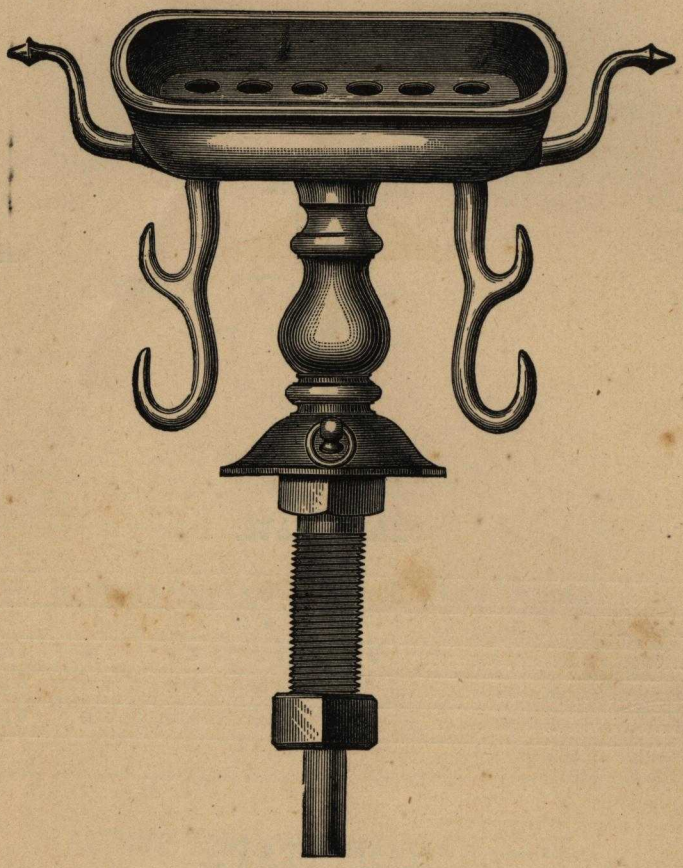
WITH RING CUP.

Figures	404	405
Description	8	9
Finished, per doz	$ 8 00	18 00
Nickel-Plated, per doz	9 00	20 00
Silver-Plated, with Gold lined Ring Cup, per doz	10 00	22 00

SOAP CUPS,

CHAIN STAY, RINGHOLDER AND BRUSH RACK COMBINED.

Fig. 409.



SOAP CUPS,

CHAIN STAY AND RINGHOLDER COMBINED.

Fig. 408.

Finished, per doz	$24 00
Nickel-Plated, per doz	26 00
Silver-Plated, with Gold lined Cup, per doz	28 00

SOAP CUPS,

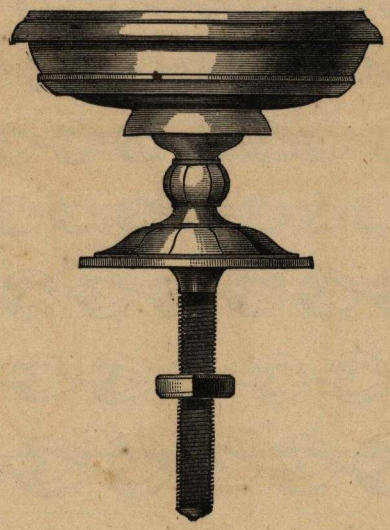
CHAIN STAY, RINGHOLDER AND BRUSH RACK COMBINED.

Fig. 409.

Brass, each	$ 7 00
Nickel-Plated, each	8 50
Silver-Plated, with Gold lined Ring Cup, each	10 00

SOAP CUPS.

No. 2. Fig. 407.



SOAP CUPS.

Figures	406	407
Description	1	2 in.
Finished, per doz	$24 00	30 00
Nickel-Plated, per doz	26 00	32 00
Silver-Plated, with Gold lined Cup, per doz	28 00	34 00

BASIN CLAMPS.

Fig. 410.

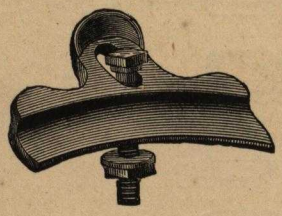


Fig. 411.

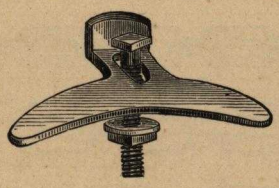
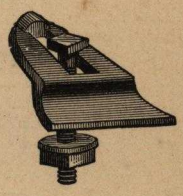


Fig. 412.

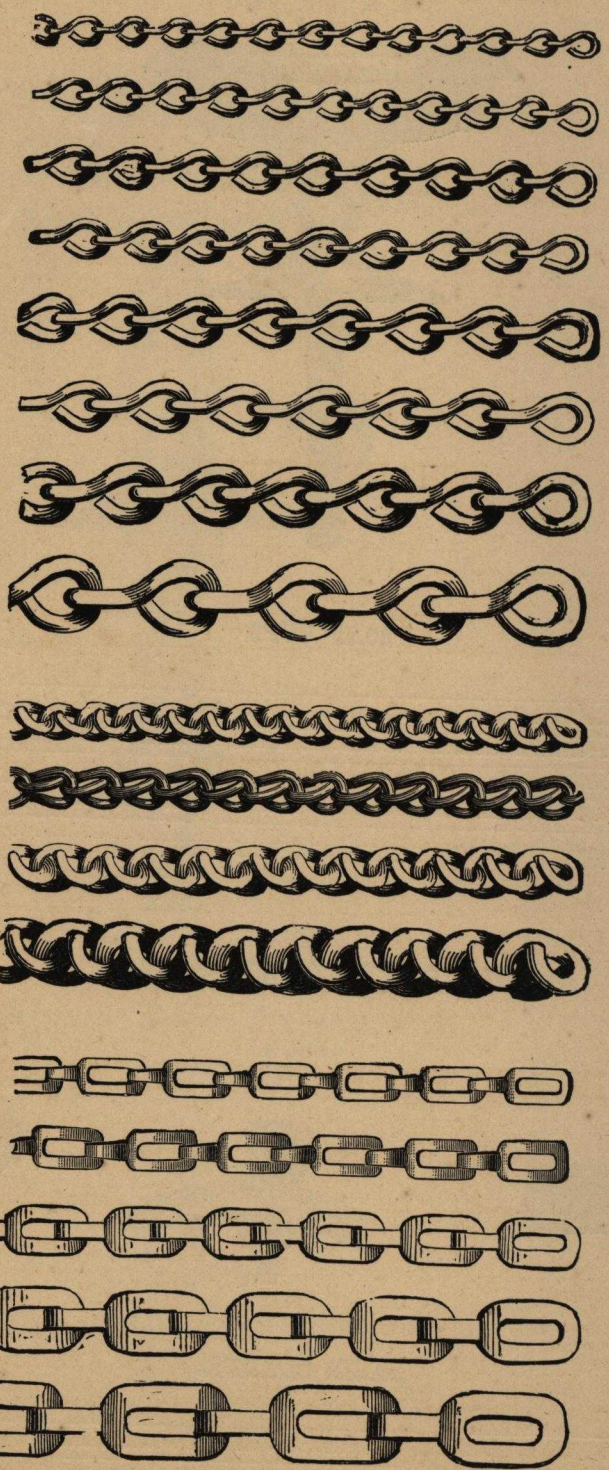


BASIN CLAMPS.

Figures	410	411	412
Per doz	$ 2 00	1 50	75

CHAINS.

Fig. 446.



WIRE GAUGE.

No. 22.
" 20.
" 18.
" 17.
" 16.
" 15.
" 14.
" 12.

DOUBLE.

No. 17.
" 15.
" 14.
" 12.

SAFETY.

No. 00.
" 0.
" 1.
" 2.
" 3.

BRASS AND PLATED

PRICE LIST OF BASIN CHAINS.

CHAIN SINGLE.

Number	22	20	18	17	16	15	14	13	12
Brass, per package doz. yards.	$ 0.55	0.70	1 00	1 10	1 25	1 40	1 70	2 05	2 50
Plated, per package doz. yards.	1 30	1 60	2 25	2 50	2 75	3 00	3 25	4 00	5 00

CHAIN DOUBLE.

Number	18	17	16	15	14	13	12
Brass, per package doz. yards	$ 1 90	1 95	2 25	2 55	3 00	4 05	5 50
Plated, per package doz. yards	3 10	3 25	3 75	4 25	5 00	6 50	8 50

CHAIN SAFETY.

Number	00	0	1	2	3
Brass, per package doz. yards	$ 2 25	2 50	3 12	4 68	6 36
Plated, per package doz. yards	3 80	4 25	5 25	7 25	9 50

BATH, BASIN AND WASH TRAY CHAINS AND SNAPS.

Price Per Package of 12 Lengths.

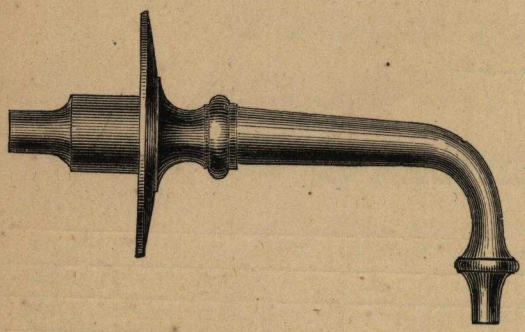
Number	Brass.	Nickel Plated.
00 Basin Safety Chains and Snaps	$1 00	1 70
17 Basin Double Chains and Snaps	90	1 60
1 Bath Safety Chains and Snaps	1 35	2 20
16 Double Chains and Snaps	1 10	1 95
12 Wash Tray Single Chains and Snaps	1 20	2 00

Basin Chains, 16 inches long.
Bath Chains, 27 " "
Wash Tray Chains, 21 " "

TUBES, WITH FLANGE AND THIMBLE,

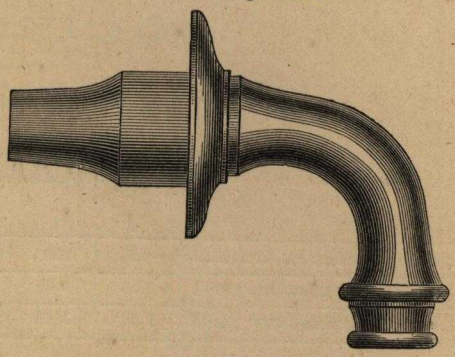
FOR BASIN.

Fig. 414.



FOR BATH.

Fig. 415.



TUBES, WITH FLANGE AND THIMBLE,

FOR BASIN.

Fig. 414.

Finished, per doz	$12 00
Nickel-Plated, per doz	14 00
Silver-Plated, per doz	18 00

TUBES, WITH FLANGE AND THIMBLE,

FOR BATH.

Fig. 415.

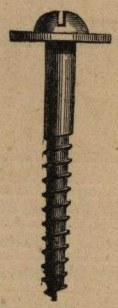
Size	⅜	½	⅝	¾ in.
Finished, per doz	$10 00	12 00	14 00	16 00
Nickel-Plated, per doz	12 00	14 00	16 00	18 00
Silver-Plated, per doz	16 00	18 00	20 00	22 00

PLATED SCREWS.

Fig. 416.

Fig. 417.

Fig. 418.



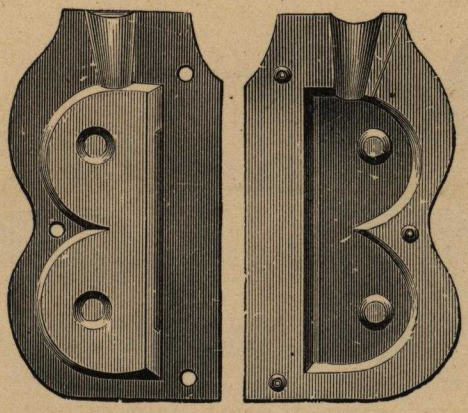
PLATED SCREWS.

Figures	416	417	418
Nickel-Plated, per doz	$ 2 00	1 50	2 00
Silver-Plated, per doz	2 50	2 00	2 50

TACK MOULDS,

SINGLE AND DOUBLE, PLAIN PATTERN.

Fig. 422.



TACK MOULDS, Single, Plain Pattern.

Fig. 422.

Each	$2 50

TACK MOULDS, Double, Plain Pattern.

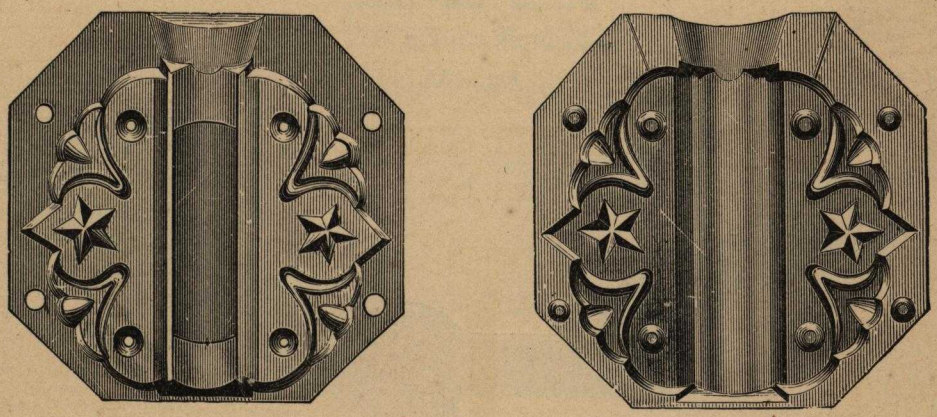
Fig. 423.

Each	$3 50

TACK MOULDS,

DOUBLE AND SINGLE, STAR PATTERN.

Fig. 425.



TACK MOULDS, Single, Star Pattern.

Fig. 424.

Each	$3 50

TACK MOULDS, Double, Star Pattern.

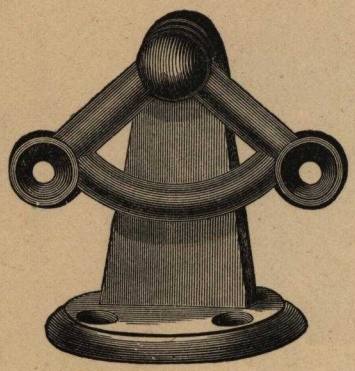
Fig. 425.

Each	$4 50

CLOSET CRANKS,

UPRIGHT.

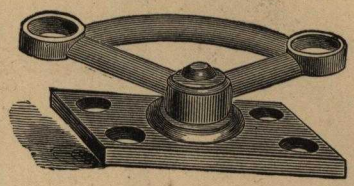
Fig. 430.



CLOSET CRANKS,

HORIZONTAL.

Fig. 431.



CLOSET CRANKS,

UPRIGHT.

Fig. 430.

Per doz	$ 3 00

CLOSET CRANKS,

HORIZONTAL.

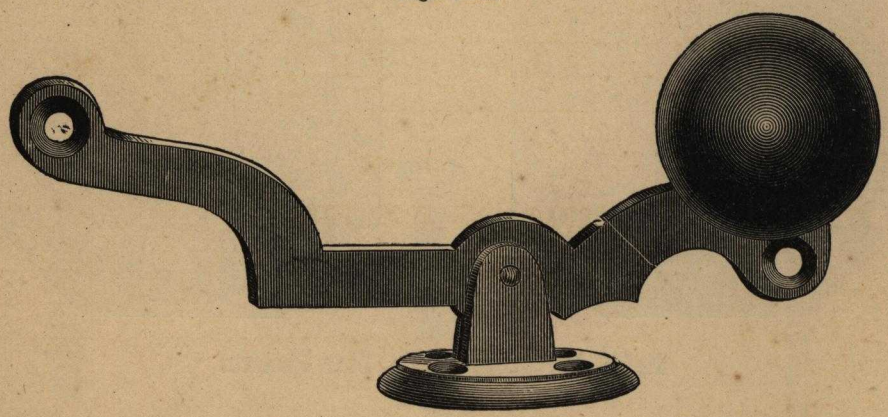
Fig. 431.

Per doz	$3 00

BALL LEVERS,

FOR CLOSETS.

Fig. 432.



BALL LEVERS,

FOR CLOSETS.

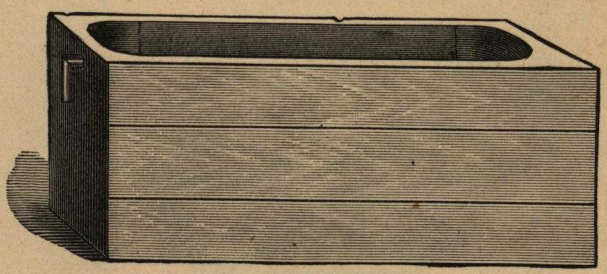
Fig. 432.

Per doz	$6 00

PLUMBERS' COPPER WARE.

COPPER BATH TUBS,

FRENCH PATTERN.



COPPER BATH TUBS.

Weight	8	10	12	14	16	18	20 oz.
Size, 5, 5½ or 6 feet long, each	$ 12 75	13 75	15 75	17 75	19 75	21 75	23 75

COPPER BATH TUBS,

FRENCH PATTERN.

Weight	8	10	12	14	16	18	20 oz.
Size, 4½ feet long, each	$ 14 00	15 00	17 00	19 00	21 00	23 00	25 00

SEAT AND FOOT TUBS.

Seat Tubs, each	$ 9 00
Foot Tubs, each	7 00

ZINC BATH TUBS.

Size, 5, 5½ or 6 feet long, each	$ 8 00

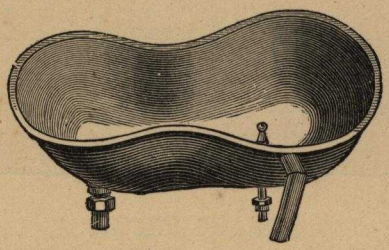
Extra Size Bath Tubs made to order.

COPPER SINKS.

COPPER SINKS.

Size	12x18	12x20	14x16	14x20	14x24	16x24	16x30	18x30 in.
Square Bottoms, each	$ 4 50	5 00	4 50	6 00	7 00	8 00	10 00	11 00
Oval Bottoms, each	5 00	5 50	5 00	6 50	8 00	9 00	11 00	12 00

COPPER BIDET PANS.



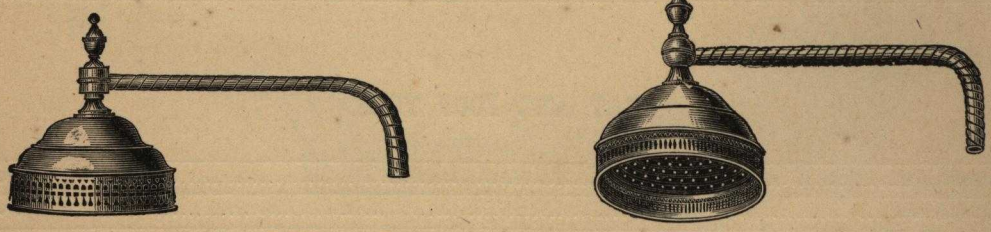
COPPER BIDET PANS.

With Supply, Overflow and Waste, each	$ 7 00

COPPER CLOSET PANS.

Light, per doz	$ 7 00
Extra Heavy, per doz	8 00
Double Weight, per doz	12 00

COPPER SHOWERS.

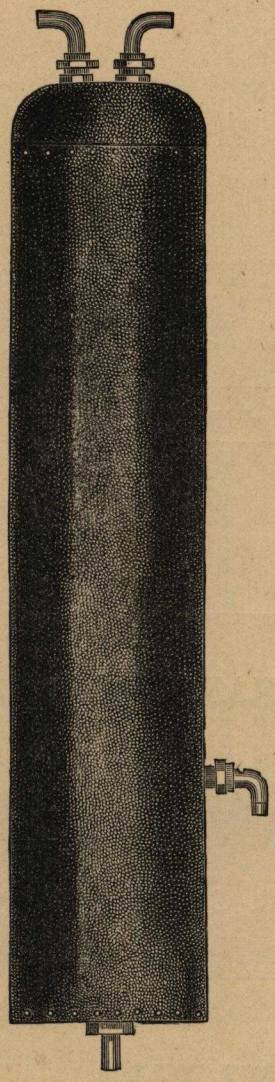


COPPER SHOWERS.

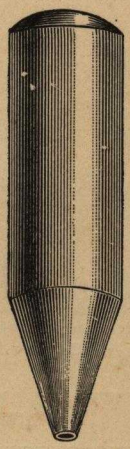
No. 1, Plain Showers, per doz	$12 00
No. 2, Fancy Showers, per doz	15 00
No. 3, Fancy Showers, Flange and Thimble, per doz	17 50
No. 4, Tubular Showers, per doz	27 00
No. 5, Fancy Tubular Showers, per doz	30 00
No. 6, Fancy Tubular Showers, Flange and Thimble, per doz	32 00

COPPER BOILERS,

LIGHT AND HEAVY PRESSURE.



COPPER AIR CHAMBERS.



COPPER AIR CHAMBERS.

Numbers	1	2
Price, each	$ 4 50	5 50

COPPER BALLS.

Size	4	5	6	7 in.
Price, per doz	$ 4 50	6 00	7 00	10 50

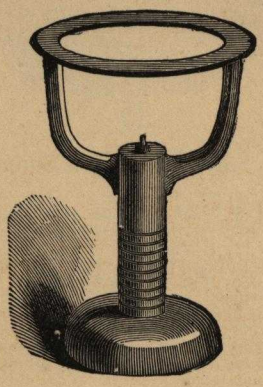
8, 10 and 12 in., 80c. per lb.

COPPER BOILERS.

Number of Gallons	30	35	40	45	50	60	70	80	90	100
Flat Head, Light	$22 00	24 00	28 00	35 00	38 00	48 00	56 00	63 00	75 00	84 00
Flat Head, Heavy	24 00	27 00	32 00	37 00	41 00	52 00	59 00	68 00	80 00	88 00
Round Head, Light	24 00	27 00	32 00	37 00	41 00	52 00	59 00	68 00	80 00	88 00
Round Head, Heavy	26 00	30 00	34 00	39 00	43 00	55 00	63 00	72 00	84 00	92 00
Round Head, Double Weight						85 00		100 00		112 00
Boxing	1 25	1 50	1 50	1 75	1 75	2 00				each.

LOCKWOOD BOILER STAND, IMPROVED.

PLAIN, BRONZED AND GALVANIZED.

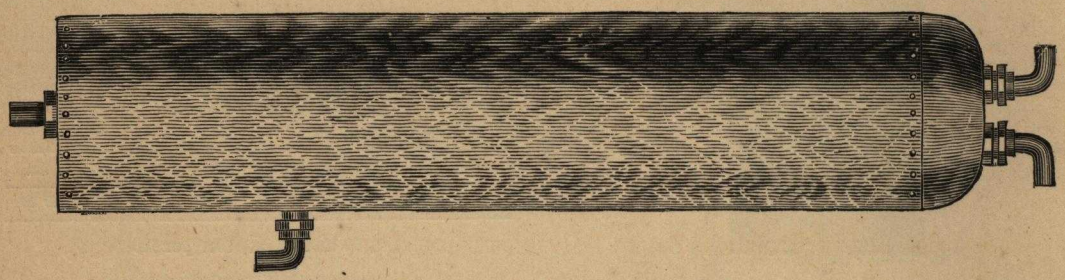


The above is a great improvement on the old style, being suitable for either Iron or Copper Boilers, Round or Square Head—the rim on outside of the Ring keeping the Boiler steadily in its place.

SIZES.	PLAIN.	GALVANIZED.	BRONZED.
12 inch Ring	$1 25	$2 50	$1 60
13 "	1 30	2 60	1 65
14 "	1 40	2 70	1 75
15 "	1 50	3 00	1 90
16 "	1 75	3 25	2 20
17 "	1 85	3 60	2 40
18 "	2 00	3 80	2 60
20 "	2 25	4 50	2 75
22 "	2 75	5 00	3 25
24 "	3 50	6 50	4 00

WROUGHT IRON DOME HEAD RANGE BOILERS,

GALVANIZED.



WROUGHT-IRON DOME HEAD RANGE BOILERS.

Capacity.	Size.	Black each.	Galv'd each.	Capacity.	Size.	Black each.	Galv'd each.
18 Gallons.	3 feet by 12 in.	$10 75	$14 05	52 Gallons.	5 feet by 16 in.	$23 25	$30 60
21 "	3½ " 12 "	11 55	14 85	63 "	6 " 16 "	29 00	38 00
24 "	4 " 12 "	12 50	15 75	53 "	4 " 18 "	25 00	31 50
27 "	4½ " 12 "	13 25	17 50	66 "	5 " 18 "	28 00	36 00
30 "	5 " 12 "	14 05	19 00	79 "	6 " 18 "	33 00	44 00
36 "	6 " 12 "	19 00	24 35	82 "	5 " 20 "	34 00	45 50
35 "	5 " 13 "	15 75	20 75	98 "	6 " 20 "	42 00	54 00
24 "	3 " 14 "	14 05	19 00	100 "	5 " 22 "	42 00	54 00
28 "	3½ " 14 "	14 85	19 80	120 "	6 " 22 "	49 00	63 00
32 "	4 " 14 "	15 75	20 75	120 "	5 " 24 "	47 50	61 50
36 "	4½ " 14 "	16 50	21 50	144 "	6 " 24 "	54 00	70 00
40 "	5 " 14 "	18 25	24 00	168 "	7 " 24 "	65 00	84 00
48 "	6 " 14 "	24 00	29 75	192 "	8 " 24 "	75 00	95 00
42 "	4 " 16 "	19 00	25 75				

OTHER SIZES MADE TO ORDER. Four Brass Couplings and Tube for each Boiler, when furnished, $2 50 *net* in addition to above prices.

GRAHAM'S IMPROVED RANGE BOILER.

PATENTED BY W. H. GRAHAM, JUNE 16, 1874.

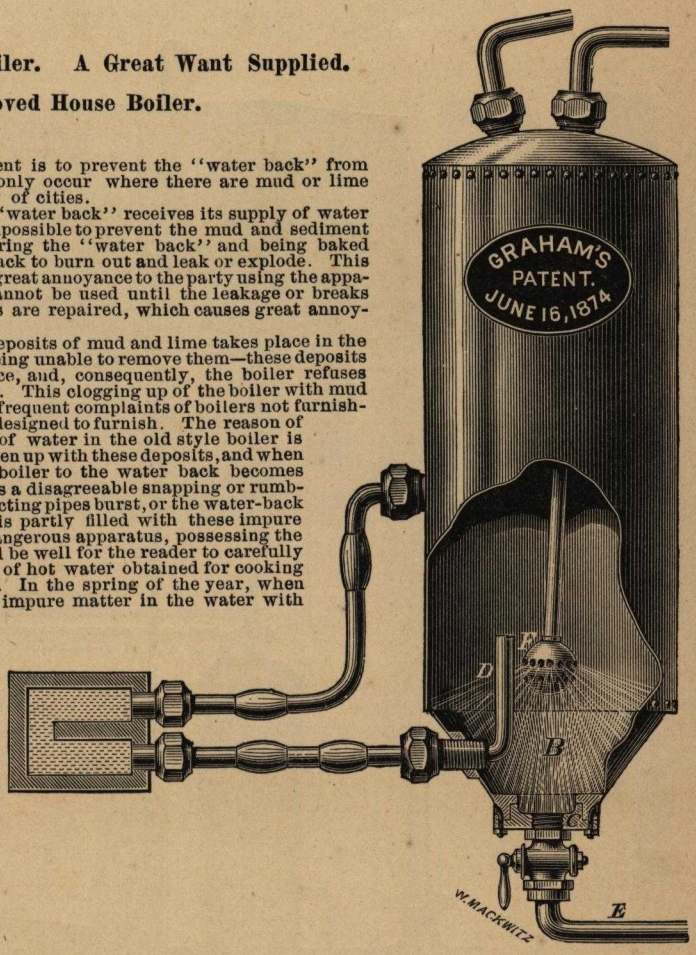
Description of the Graham Boiler. A Great Want Supplied.

Graham's Improved House Boiler.

The main purpose of this improvement is to prevent the "water back" from burning out or exploding, which will only occur where there are mud or lime forming impurities in the water supply of cities.

It is very evident, in cases where the "water back" receives its supply of water from the bottom of a boiler, that it is impossible to prevent the mud and sediment deposited from time to time from entering the "water back" and being baked thereon. This will inevitably cause the back to burn out and leak or explode. This necessitates expensive repairs and causes great annoyance to the party using the apparatus, as the whole cooking apparatus cannot be used until the leakage or breaks in the "water back" and connecting pipes are repaired, which causes great annoyance and delay.

In the first place, when the heavy deposits of mud and lime takes place in the boiler and water back—and the operator being unable to remove them—these deposits will then inevitably occupy the water space, and, consequently, the boiler refuses to supply the desired amount of hot water. This clogging up of the boiler with mud and sediment is the principal cause of the frequent complaints of boilers not furnishing the amount of hot water that they are designed to furnish. The reason of this failure to supply the proper amount of water in the old style boiler is simply that one-fourth of its capacity is taken up with these deposits, and when in this condition the feed-pipe from the boiler to the water back becomes partly filled with these deposits and causes a disagreeable snapping or rumbling noise, which continues until the connecting pipes burst, or the water-back burns out or explodes. When a boiler is partly filled with these impure deposits, it forms a very expensive and dangerous apparatus, possessing the very objectionable feature, which it would be well for the reader to carefully consider, and that is the inferior quality of hot water obtained for cooking purposes from a boiler in this condition. In the spring of the year, when there is considerable vegetable and other impure matter in the water with which the boiler is supplied, and when this matter remains in the boiler to be boiled over and over again, it is very evident at a glance that such water is unfit for use. And further, by an examination of the construction of the old style boiler, it will be seen that this objectionable feature is an annoyance which cannot be done away with, as it does not possess any perfect way of cleaning the boiler. To perfectly clean this boiler necessitates the breaking of the connections and the removal of boiler from its position, which makes the cleaning of the boiler a very expensive operation. The Graham Improved Boiler is the only perfect hot water boiler.



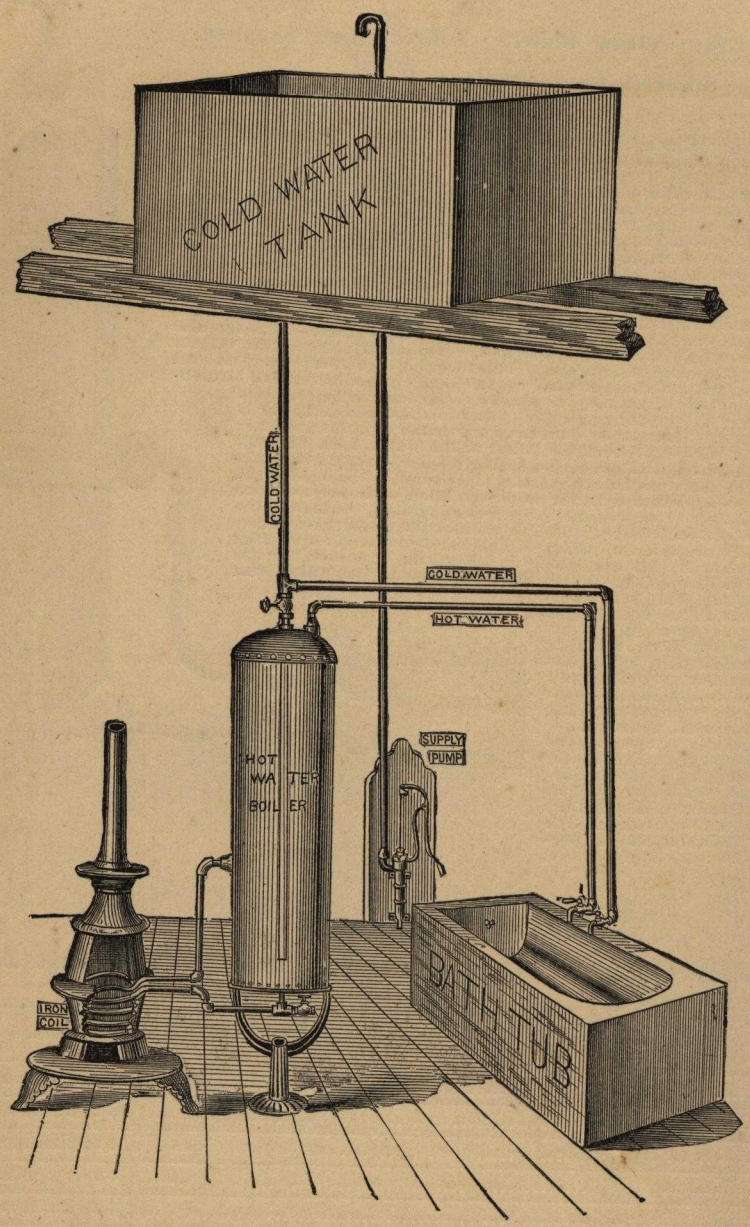
Price List of Graham's Patent Galvanized Iron Dome Head Range Boilers.

CAPACITY.	SIZE.	PRICE.
30 Gallons	5 feet x 12 inches.	$27 00
35 Gallons	5 feet x 13 inches.	31 00
40 Gallons	5 feet x 14 inches.	34 00
50 Gallons	5 feet x 16 inches.	40 00
60 Gallons	6 feet x 16 inches.	46 00
70 Gallons	5 feet x 18 inches.	50 00
80 Gallons	6 feet x 18 inches.	56 00
100 Gallons	5 feet x 22 inches.	68 00

Couplings Extra; per set, consisting of one set Regular Boiler Couplings, one 1-inch Straight Coupling, and one 1-inch Round Way Cock, with Dip Pipe and Rose extra, $8 00.

APPARATUS FOR HOT AND COLD WATER SUPPLY,

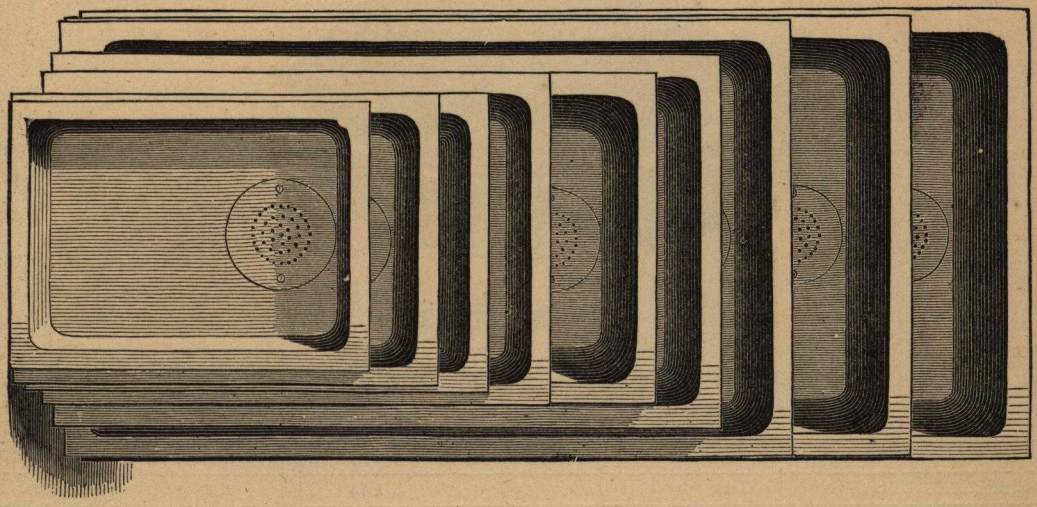
FOR DWELLINGS AND BATH HOUSES.



The above Illustration, comprising Stove, Bath Tub, Boiler, Tank and Cold Water Pump, shows our method for heating water for Bath Tubs in Dwellings and Bath Houses, for one or more Tubs, with Stove for coal or wood, in localities where they have no Water Works.

PLUMBERS' IRON WARE.

SQUARE SINKS.



SQUARE SINKS.

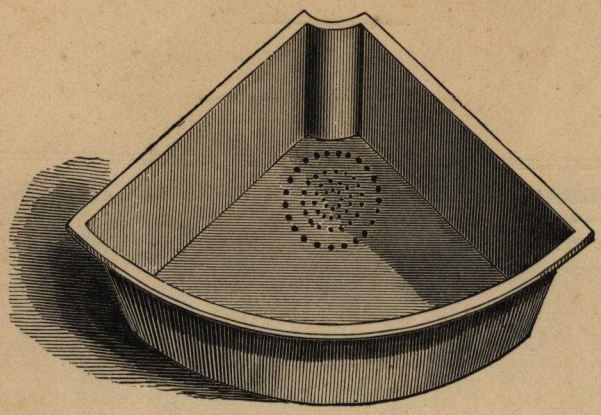
Sizes.	Plain.	Galvanized.	Enameled.
16½ x 12½ 5 in. deep	$1 10	$2 30	$4 50
18 x 12 6 "	1 25	2 60	4 75
16 x 16 6 "	1 60	3 25	5 25
22 x 14 6 "	1 60	3 30	5 75
23 x 15 6 "	1 70	3 40	6 25
25½ x 15½ 6 "	1 75	3 60	6 50
20 x 12½ 6 "	1 50	3 10	5 25
20 x 14 6 "	1 50	3 20	6 00
24 x 14 6 "	1 70	3 75	6 25
24½ x 16 6 "	1 80	4 00	6 50
24 x 18 6 "	2 10	4 30	7 00
25½ x 17½ 6 "	2 10	4 30	7 00
27 x 15 6 "	2 00	4 25	7 25
24 x 20 6 "	2 40	5 00	7 50
28 x 17 6 "	2 20	4 50	7 50
28 x 20 6 "	2 70	5 50	8 00
30 x 16 6 "	2 25	4 75	7 75
30 x 18 6 "	2 50	5 10	8 50
30 x 20 6 "	3 00	6 25	9 00
32½ x 18 6 "	3 00	6 25	9 50
32½ x 21 6 "	3 40	7 20	9 75
36 x 18 6 "	3 00	6 50	9 50
36 x 21½ 6 "	3 70	7 75	10 50
38 x 20 6 "	3 80	8 00	11 00
42 x 22 6 "	4 25	9 00	12 00
48 x 20 6 "	5 30	11 50	13 25
48 x 23 6 "	5 75	12 25	15 00
24 x 14 8 "	2 50	5 25	8 00
30 x 24 8 "	5 00	10 50	13 00
50 x 24 6½ "	7 50	16 00	18 00
50 x 26 6½ "	8 00	17 00	20 00
62 x 22 8 "	10 75	22 00	26 00
76 x 22 7 "	15 00	32 00	32 00
56 x 32 9 "	16 00	35 00	32 00
60 x 28 10 "	18 00	40 00	35 00
78 x 28 10 "	25 00	50 00	45 00
94 x 24 10 "	30 00	60 00	
120 x 22 6 "	32 00		

Patent Overflow Sinks, add to above price $1 00.

Patent Overflow Sinks, with Plug Strainers, add to above price list: Plain, $1 20; Galvanized, $1 25; Enameled, $1 30.

CORNER SINKS,

PLAIN, GALVANIZED AND ENAMELED.



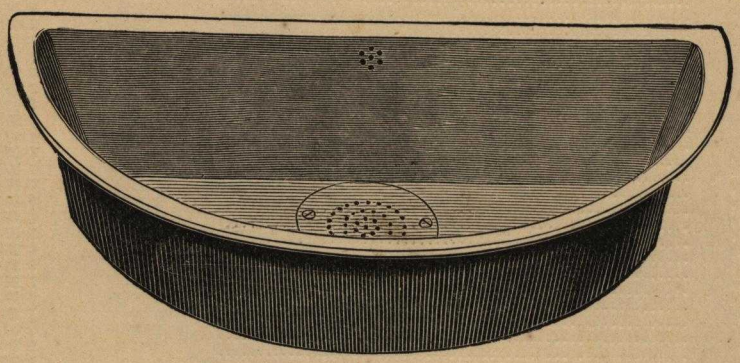
CORNER SINKS,

PLAIN, GALVANIZED AND ENAMELED.

	BACK.	WIDTH.	DEPTH.	PLAIN.	GALVANIZED.	ENAMELED.
No. 1.....	17 inches.	25 inches.	6 inches.	$ 1 25	$ 2 75	$ 6 00
No. 2.....	20 "	28 "	6 "	1 75	3 50	7 00
No. 3.....	22 "	31 "	6 "	2 10	4 20	8 00

HALF CIRCLE SINKS,

PLAIN, GALVANIZED AND ENAMELED.



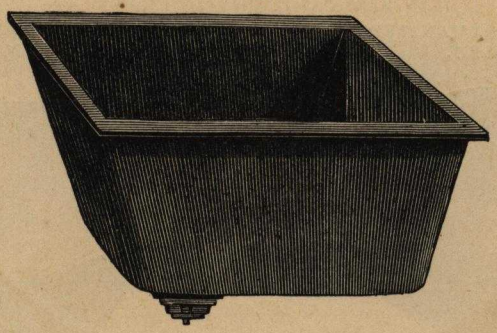
HALF CIRCLE SINKS,

PLAIN, GALVANIZED AND ENAMELED.

	BACK.	WIDTH.	DEPTH.	PLAIN.	GALVANIZED.	ENAMELED.
No. 1.....	24 inches.	14 inches.	6 inches.	$ 1 50	$ 3 25	$ 6 00
No. 2.....	27 "	15 "	6 "	1 80	3 90	7 00
No. 3..... ...	29 "	16 "	6 "	2 50	5 00	8 00
No. 4.....	31½ "	17 "	6 "	2 25	4 75	9 00

SLOP SINKS,

PLAIN, GALVANIZED AND ENAMELED.



SQUARE SLOP SINKS.

Sizes.	Plain.	Galvanized.	Enameled.
16 x 16 x 10 inches deep	$2 70	$5 25	$7 50
20 x 14 x 12 inches deep	3 50	6 50	8 50
20 x 16 x 12 inches deep	4 00	8 25	10 00
24 x 20 x 12 inches deep	5 00	9 50	11 50
23 x 15 x 15 inches deep	4 25	8 00	11 00
30 x 20 x 12 inches deep	8 00	15 00	16 00
36 x 21 x 12 inches deep	10 00	19 00	20 00
36 x 21 x 16 inches deep	14 00	27 00	28 00
48 x 20 x 17 inches deep	20 00	36 00	38 00
Add, if with Patent Overflow	1 00	1 00	1 00
Add, if with Patent Overflow and Plug Strainer	1 20	1 25	1 30

SINK BACKS.

Sizes.	Plain.	Galvanized.	Enameled.
20 inches	$1 25	$2 25	$3 25
22 inches	1 35	2 50	3 40
23 inches	1 40	2 70	3 50
24 inches	1 50	2 80	3 70
25½ inches	1 60	3 00	4 25
27 inches	1 70	3 25	4 50
28 inches	1 80	3 50	4 75

Sizes.	Plain.	Galvanized.	Enameled.
30 inches	$2 00	$4 00	$5 00
32½ inches	2 25	4 25	5 25
36 inches	2 75	5 00	6 00
38 inches	3 00	5 50	6 50
42 inches	3 50	6 00	7 00
48 inches	4 25	7 00	8 00

Square Sinks fitted with Legs and Backs. To prices of Square Sinks add prices of Legs and Backs.

SINK LEGS.

Plain, each	.50
Galvanized, each	$1.00

SINK COUPLINGS.

Plain, per doz	$1 50
Galvanized, per doz	2 00

OPEN SINK STRAINERS.

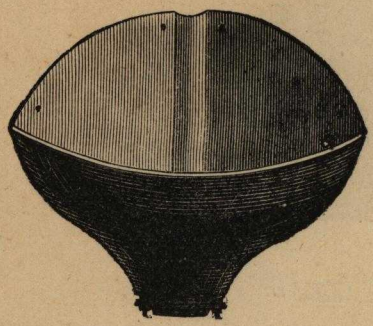
Plain, per doz	$1 50
Galvanized, per doz	2 60
Enameled, per doz	3 00

PLUG SINK STRAINERS.

Plain, per doz	$ 3 25
Galvanized, per doz	5 00
Enameled, per doz	6 00

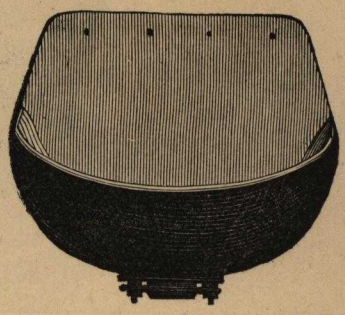
CORNER URINALS,

PLAIN, PAINTED, GALVANIZED AND ENAMELED.



HALF CIRCLE URINALS,

PLAIN, PAINTED, GALVANIZED AND ENAMELED.



CORNER URINALS,

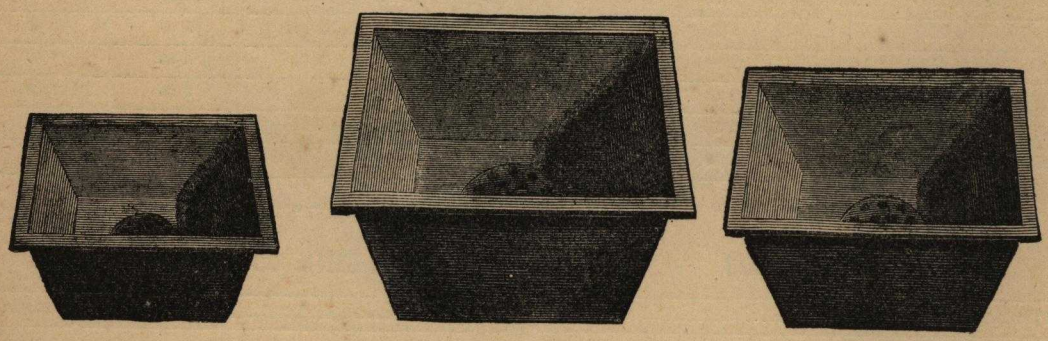
ENGLISH PATTERN.

Sizes.	Plain.	Painted.	Galvanized.	Enameled.
No. 1, 7 inches on Side	$ 75	$ 90	$ 1 20	$ 1 75
No. 2, 9 inches on Side	1 00	1 15	1 70	2 25
No. 3, 12 inches on Side	1 25	1 45	2 25	2 75

HALF CIRCLE URINALS.

Sizes.	Plain.	Painted.	Galvanized.	Enameled.
No. 1, 12 inches on Back	$ 1 00	$ 1 15	$ 2 00	$ 2 50
No. 2, 15 inches on Back	1 30	1 50	2 50	3 00

HYDRANT CESSPOOLS.

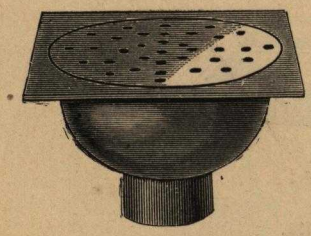


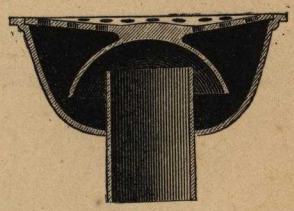
HYDRANT CESSPOOLS.

Size 12 x 12 x 6 inches deep	$ 1 00
Size 14 x 14 x 6 inches deep	1 15
Size 16 x 16 x 6 inches deep	1 30

CESSPOOLS,

WITH BELL TRAP. LIGHT AND HEAVY.



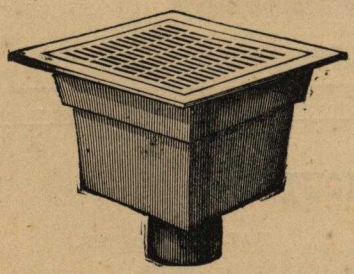


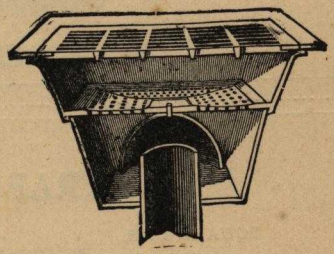
CESSPOOLS, with Bell Traps.

Light, size 13x13	$ 1 50
Medium, size 13x13	2 50
Heavy, size 13x13	3 00

CESSPOOLS,

WITH BELL TRAP AND GRATING.

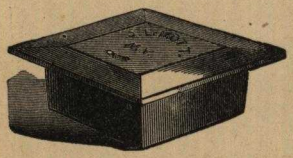




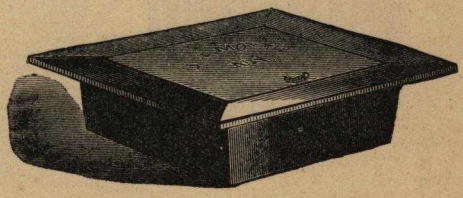
CESSPOOLS, with Bell Trap and Grating.

Each	$ 4 50

STOP COCK BOX.



STREET WASHER BOX.



STOP COCK BOX.

Each	$ 0 75
Pattern for Plumber's Address, each, net	2 00

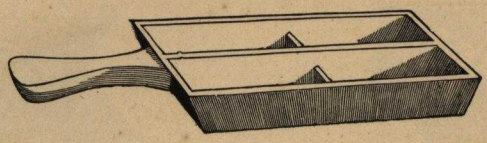
STREET WASHER BOX.

Each	$ 1 25
Extra Heavy, each	3 50
Pattern for Plumber's Address, each, net	2 00

Plumber's Address cast on Covers to Order.

SOLDER MOULDS,

TWO BARS AND FOUR BARS.

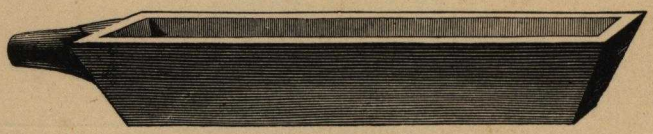


SOLDER MOULDS,

TWO BARS AND FOUR BARS.

Solder Moulds, Two Bars	$1 00
Solder Moulds, Four Bars	1 50

PIG LEAD MOULDS.

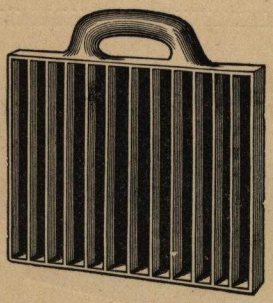


PIG LEAD MOULDS.

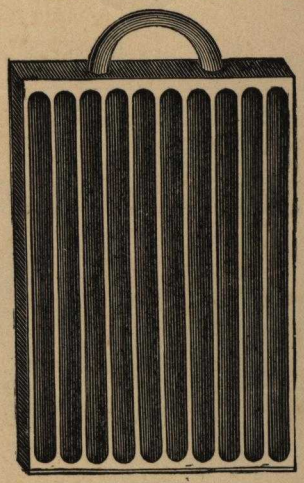
Price	$4 00

STRAP SOLDER MOULDS,

SQUARE BAR.



HALF ROUND BAR.



STRAP SOLDER MOULDS

SQUARE BAR.

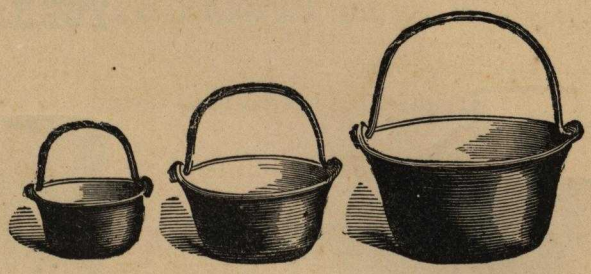
Price	$3 00

STRAP SOLDER MOULDS,

HALF ROUND BAR.

Price	$3 00

SOLDER POTS.



SOLDER POTS.

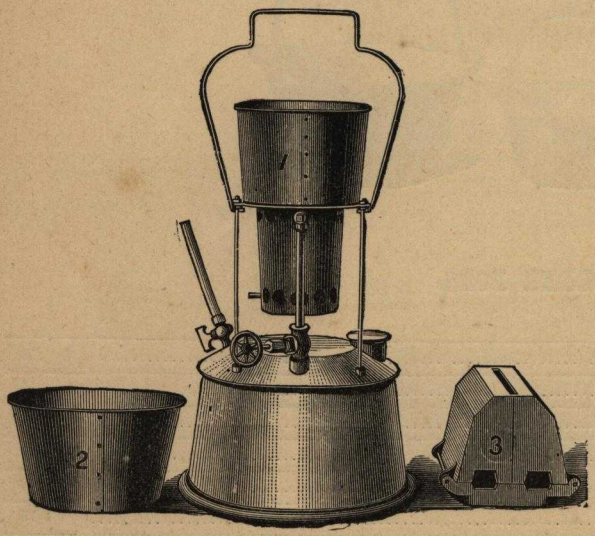
No. 1, 5 in. diameter on top	$ .50
No. 2, 6 in. diameter on top	.65
No. 3, 6½ in. diameter on top	.70
No. 4, 8 in. diameter on top	1 10
No. 5, 9 in. diameter on top	1 30
No. 6, 10½ in. diameter on top	1 75
No. 7, 13½ in. diameter on top	3 50

CHARCOAL FURNACES.

CHARCOAL FURNACES.

No. 2, 12 in. diameter on top	$ 1 50
No. 3, 13 in. diameter on top	1 75
No. 4, 14 in. diameter on top	2 25
No. 5, 15 in. diameter on top	2 50

PLUMBERS' BLAST FURNACE.



To the Trade:

The great difficulty under which Plumbers have always labored for want of a safe, quick and convenient method of heating their metal and irons has at last been entirely removed, and we take pleasure in presenting the Plumbers' Blast Furnace to the Trade.

Its absolute safety, simplicity of construction and its effectiveness will at once commend it to every one. No accident with it has ever been known.

It will melt 10 lbs. of solder in six minutes at a nominal expense, gives out no smoke or smell and makes no dirt.

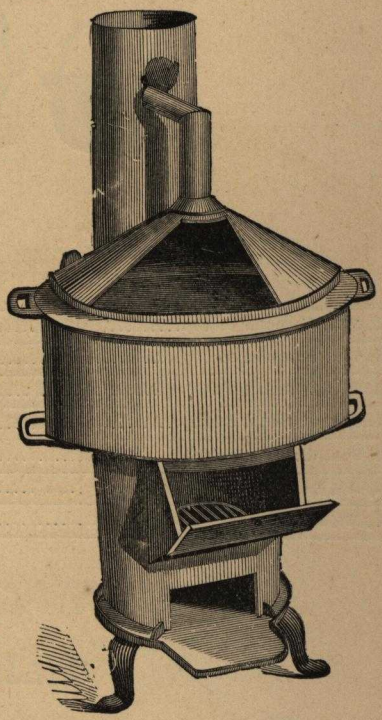
The Furnace measures 14½ inches in height, and weighs but 4½ lbs., making it very portable and convenient for every occasion when solder or irons or both are required.

We have received the most unqualified commendation from every one using them. All testify that no Plumber can afford to be without one.

PLUMBERS' BLAST FURNACE.

Price to the Trade, boxed for shipment.....	$ 9 00

MOTT'S PATENT PLUMBERS' FURNACE.



The above is made expressly for melting metal. The fire passes entirely around the Caldron, same as when set in brick work. The top is cast iron, made with a slide to open, to take out the metal. The small pipe on the top of the cover conveys the offensive vapor from scrap lead into the smoke pipe.

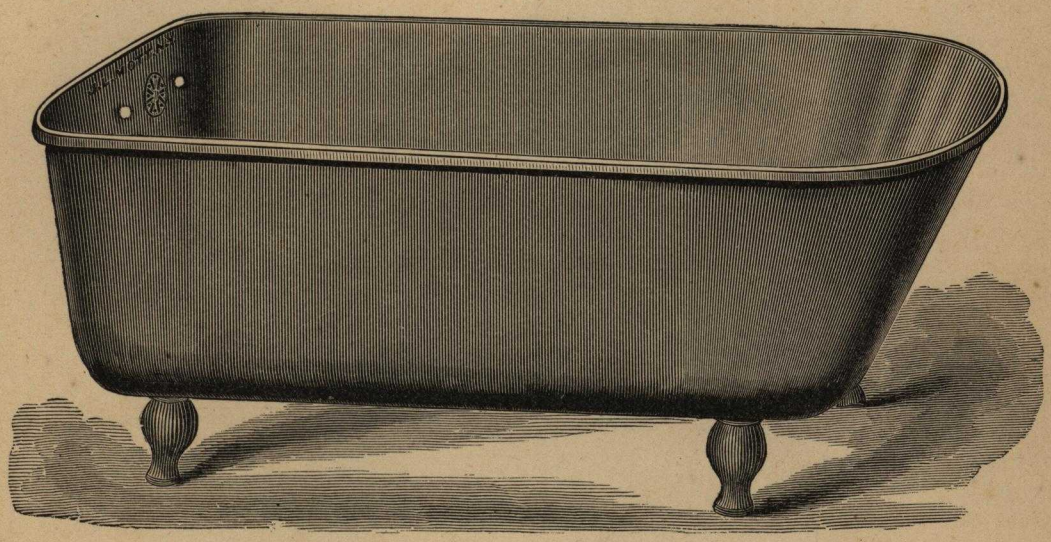
Capacity of Caldron, 8 gallons. Caldrons made extra heavy to order.

MOTT'S PATENT PLUMBERS' FURNACE.

Price, complete as above.....	$14 00
Price, Caldron (only).....	3 50
Price, Caldron, extra heavy.....	5 00

MOTT'S FRENCH BATH TUBS,

PLAIN, GALVANIZED AND ENAMELED.



MOTT'S FRENCH BATH TUBS,

NICKEL-PLATED, OVERFLOW STRAINERS, RUBBER PLUGS AND BRASS COUPLINGS.

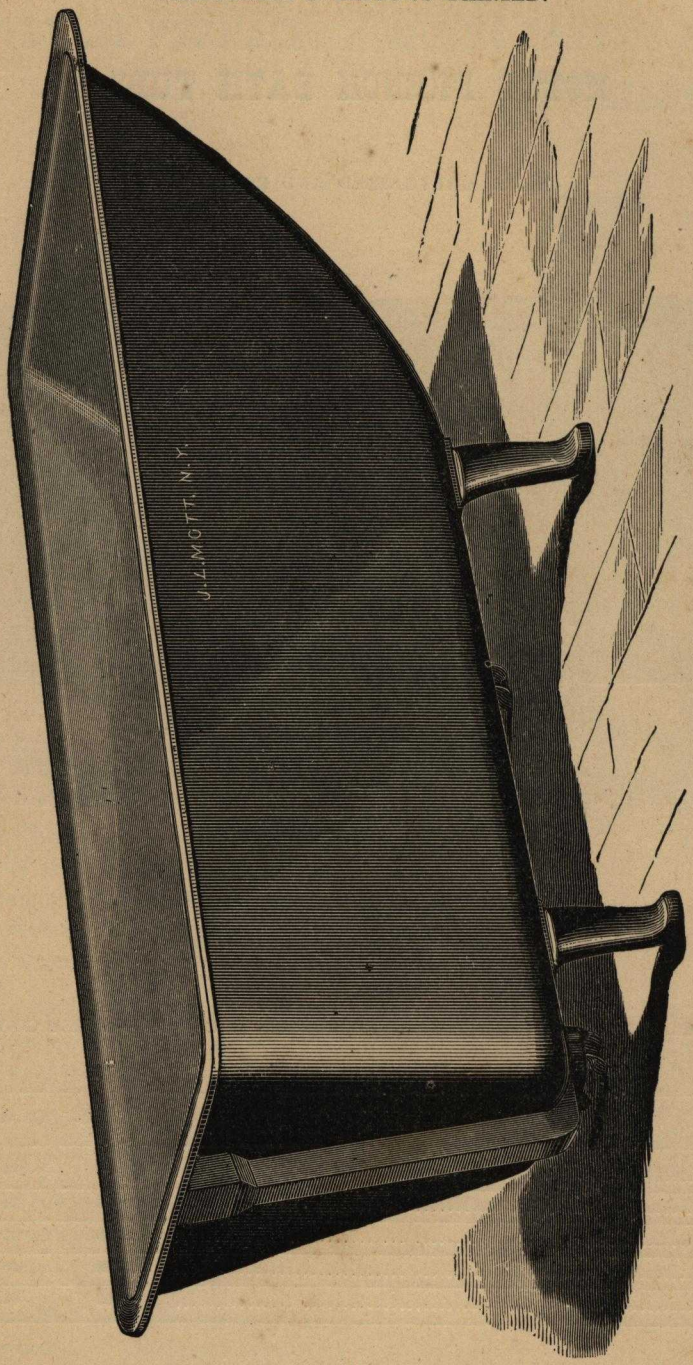
LENGTH.	Painted.	Galvanized.	Enameled.
4 feet long	$18 00	$30 00	$34 00
4½ feet long	20 00	34 00	38 00
5 feet long	22 00	37 00	42 00
5½ feet long	24 00	40 00	46 00
6 feet long	26 00	44 00	50 00

BOXING.

4, 4½ and 5 foot Tubs, net	$1 00
5½ and 6 foot Tubs, net	1 25

MOTT'S BATH TUBS,

WITH PATENT OVERFLOWS—PAINTED.



MOTT'S BATH TUBS,

WITH PATENT OVERFLOWS AND RUBBER PLUGS—PAINTED.

No. 1, 5½ feet long	$ 20 00
No. 2, 6 feet long	22 00
With Coupling for Iron Pipe, extra	75

MOTT'S BATH TUBS,

WITH PATENT OVERFLOWS AND RUBBER PLUGS, FOR ASYLUMS AND HOSPITALS. BOSSES TAPPED FOR IRON PIPES—PAINTED.

No. 1, 5½ feet long	$ 21 50
No. 2, 6 feet long	23 50
With Coupling for Iron Pipe, extra	75

Boxing Extra; same as on Page 111.

HALF CIRCLE SLAB AND BOWLS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING—PLAIN, PAINTED, GALVANIZED AND ENAMELED. SMALL PATTERN.

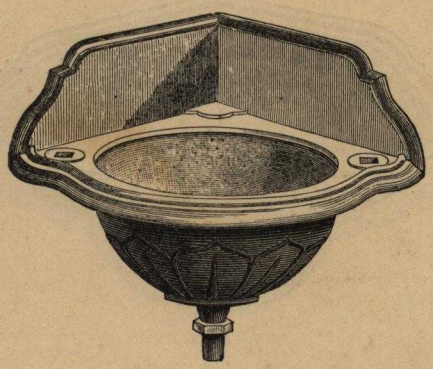
HALF CIRCLE SLAB AND BOWLS,

WITH PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$3 50
Painted	4 00
Galvanized	5 50
Enameled	7 50

CORNER SLAB AND BOWLS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING—PLAIN, PAINTED, GALVANIZED AND ENAMELED. SMALL PATTERN.



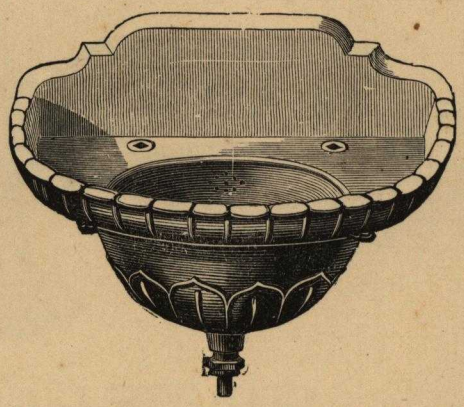
CORNER SLAB AND BOWLS,

WITH PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$3 50
Painted	4 00
Galvanized	5 50
Enameled	7 50

HALF CIRCLE SLAB AND BOWL,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING. PLAIN, PAINTED, GALVANIZED AND ENAMELED. MEDIUM PATTERN.



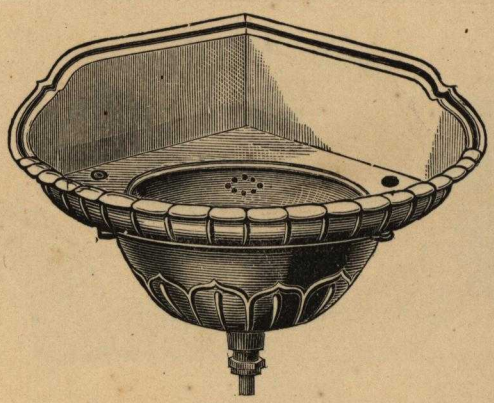
HALF CIRCLE SLAB AND BOWL,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$ 4 50
Painted	5 00
Galvanized	7 50
Enameled	9 50

CORNER SLAB AND BOWL,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING. PLAIN, PAINTED, GALVANIZED AND ENAMELED. MEDIUM PATTERN.



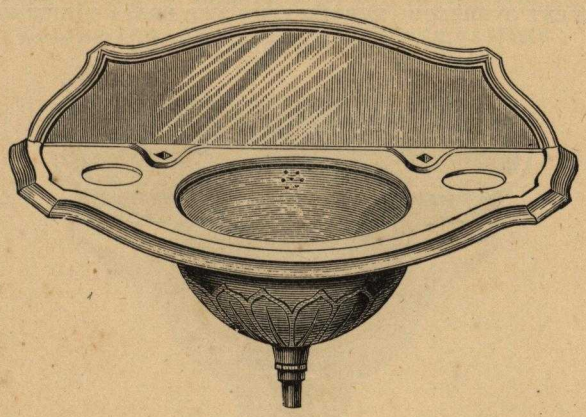
CORNER SLAB AND BOWL,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$ 4 50
Painted	5 00
Galvanized	7 50
Enameled	9 50

HALF CIRCLE SLABS AND BOWLS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING—PLAIN, PAINTED, GALVANIZED AND ENAMELED. LARGE PATTERN.



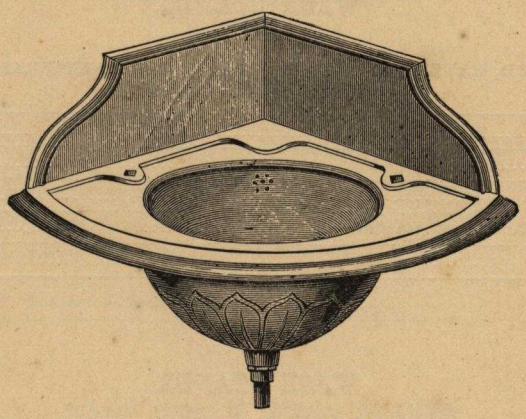
HALF CIRCLE SLABS AND BOWLS,

WITH PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain, each	$ 5 00
Painted, each	5 50
Galvanized, each	8 00
Enameled, each	12 00

CORNER SLABS AND BOWLS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING—PLAIN, PAINTED, GALVANIZED AND ENAMELED. LARGE PATTERN.



CORNER SLABS AND BOWLS,

WITH PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain, each	$ 5 00
Painted, each	5 50
Galvanized, each	8 00
Enameled, each	12 00

WASH STANDS,

ON STANDARD, PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING—PLAIN, PAINTED, GALVANIZED AND ENAMELED.

WASH STANDS,

ON STANDARD, PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$ 6 00
Painted	7 00
Galvanized	10 00
Enameled Slab and Bowl, with Bronzed Standard	11 00
Standard	2 00

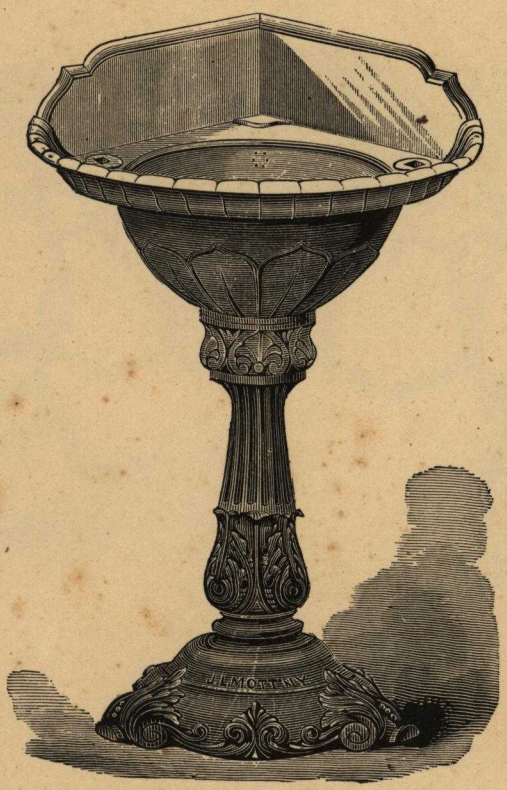
WASH STANDS,

ON FRAME, PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$ 6 00
Painted	7 00
Galvanized	10 00
Enameled Slab and Bowl, with Bronzed Frame	11 00
Frame	2 00

CORNER WASH STANDS,

ON STANDARD. PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING. PLAIN, PAINTED, GALVANIZED AND ENAMELED. MEDIUM PATTERN.



CORNER WASH STANDS,

ON STANDARD. PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$ 6 50
Painted	7 00
Galvanized	11 00
Enameled Slab and Bowl, with Bronzed Standard	11 50

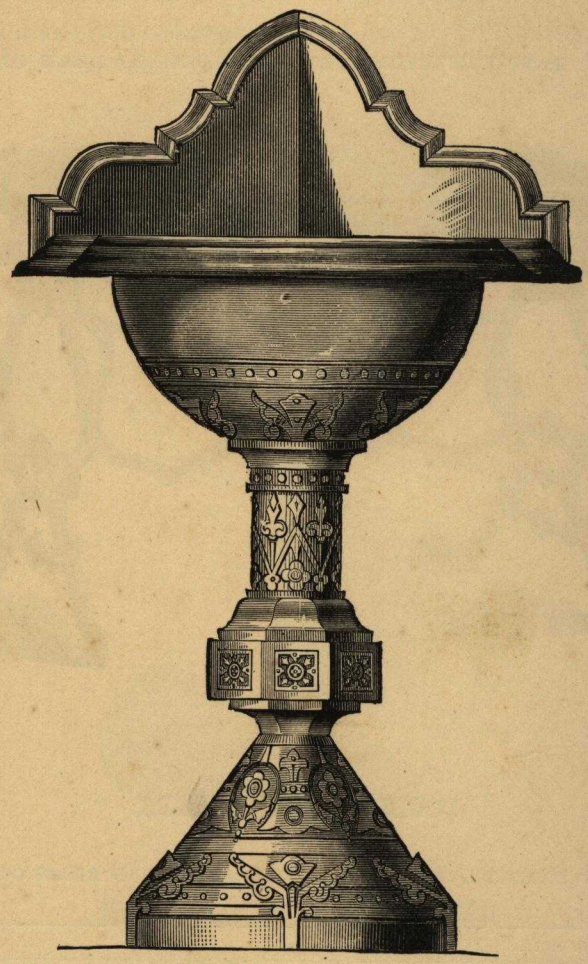
HALF CIRCLE WASH STANDS,

ON STANDARD. PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain	$ 6 50
Painted	7 00
Galvanized	11 00
Enameled Slab and Bowl, with Bronzed Standard	11 50

CORNER WASH STANDS,

ON STANDARD. PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING. PLAIN, PAINTED, GALVANIZED AND ENAMELED. STANDARD, INLAID WITH TILE.



HALF CIRCLE WASH STANDS,

STANDARD, INLAID WITH TILE.

Plain	$ 9 00
Painted	10 00
Galvanized	14 00
Enameled Slab and Bowl, with bronzed standard	16 00

CORNER WASH STANDS,

STANDARD, INLAID WITH TILE.

Plain	$ 9 00
Painted	10 00
Galvanized	14 00
Enameled Slab and Bowl, with bronzed standard	16 00

DIMENSIONS OF ABOVE.—Height to Front of Slab, 31 in.; Height to Top of Back, 39 in.; Diameter of Bowl, 12 in.

HALF CIRCLE WASH STANDS,

STANDARD, INLAID WITH TILE.

Plain	$10 00
Painted	11 00
Galvanized	15 00
Enameled Slab and Bowl, with bronzed standard	17 00

CORNER WASH STANDS,

STANDARD, INLAID WITH TILE.

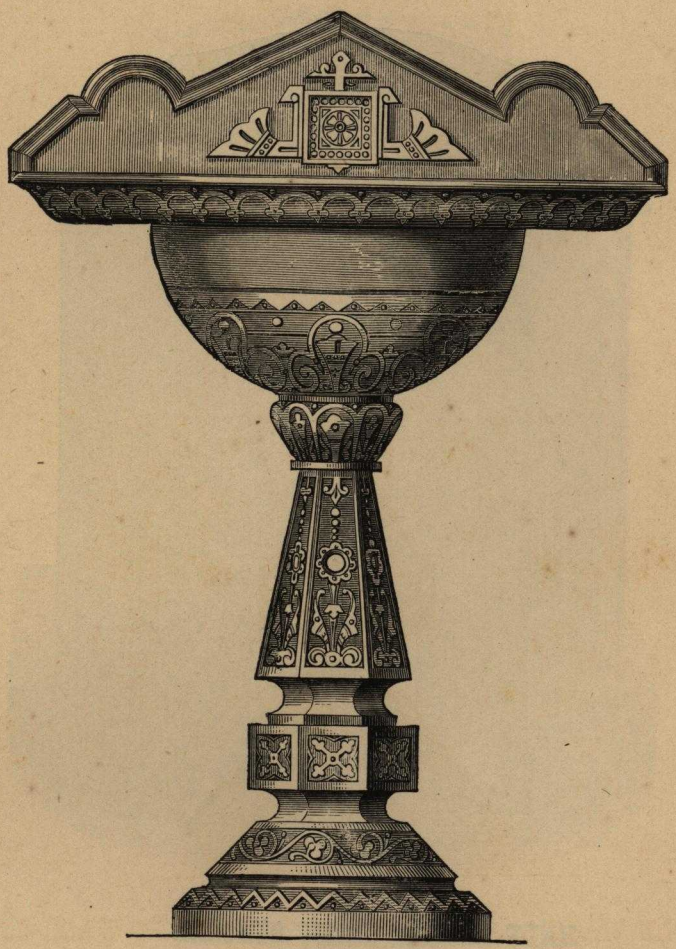
Plain	$10 00
Painted	11 00
Galvanized	15 00
Enameled Slab and Bowl, with bronzed standard	17 00

DIMENSIONS OF ABOVE.—Height to Front of Slab, 31½ in.; Height to Top of Back, 39 in.; Diameter of Bowl, 12 in.

HALF CIRCLE WASH STANDS,

ON STANDARD, PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

SLAB AND BOWL ENAMELED, WITH NICKEL AND TILE ORNAMENT ON BACK. STANDARD BRONZED AND INLAID WITH TILE.



HALF CIRCLE WASH STANDS,

ENAMELED SLAB AND BOWL, WITH NICKEL AND TILE ORNAMENT, STANDARD BRONZED AND INLAID WITH TILE.

Price	$ 17 50

DIMENSIONS.—Height to front of Slab, 31 inches; height to top of Back, 39 inches; length of Back, 22½ inches; Diameter of Bowl, 12 inches.

HALF CIRCLE WASH STANDS,

ENAMELED SLAB AND BOWL, WITH NICKEL AND TILE ORNAMENT, STANDARD BRONZED AND INLAID WITH TILE.

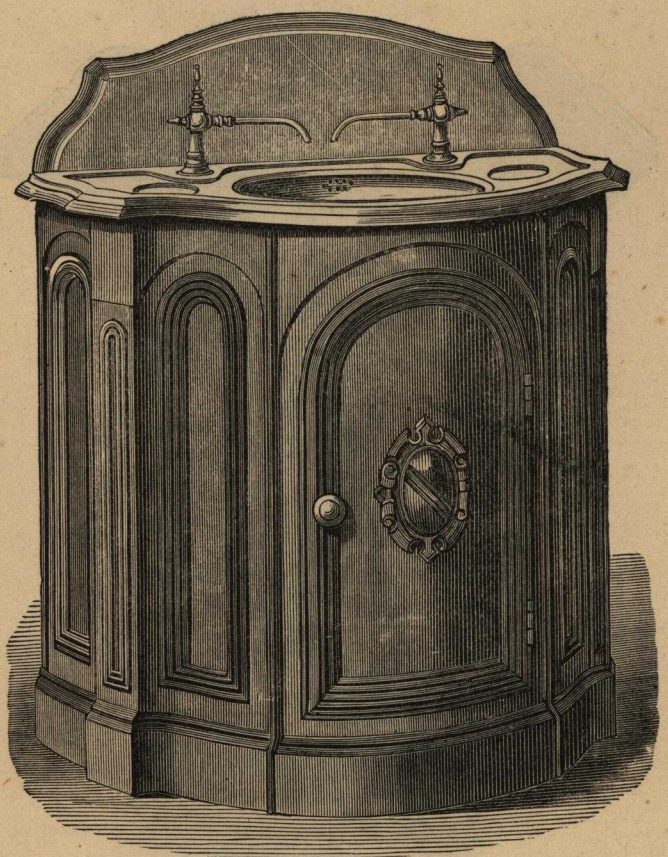
Price	$ 18 50

DIMENSIONS.—Height to front of Slab, 31½ inches; height to top of Back, 39 inches; length of Back, 24 inches; Diameter of Bowl, 12 inches.

HALF CIRCLE WASH STANDS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

PLAIN, PAINTED, GALVANIZED AND ENAMELED, WITH PLAIN PAINTED, GALVANIZED OR MARBLEIZED FRAMES.



HALF CIRCLE WASH STANDS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

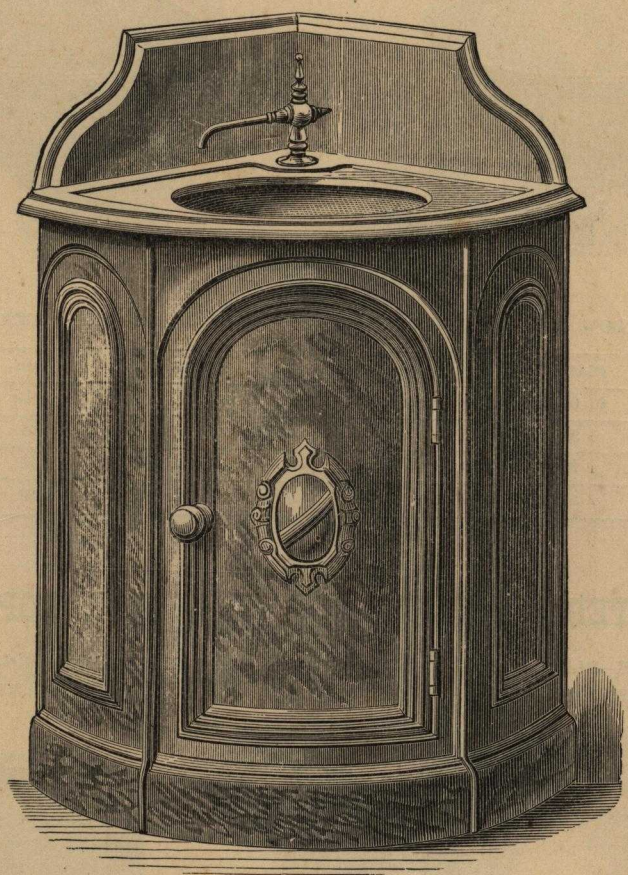
Plain Slab and Frame	$ 12 00
Painted Slab and Frame	13 00
Galvanized Slab and Plain Frame	15 00
Enameled Slab and Plain Frame	19 00
Enameled Slab and Bronzed Frame	20 00
Enameled Slab and Marbleized Frame	25 00
Frame—Plain	7 00
Frame—Painted	7 50
Frame—Bronzed	8 00
Frame—Marbleized	13 00

DIMENSIONS.—Height to Slab, 28 inches; height to top of Back, 35 inches; length of Back, 30 inches; Diameter of Bowl, 12 inches.

NOTE.—State, when ordering, whether one or two Faucet holes are required.

CORNER WASH STANDS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING—PLAIN, PAINTED, GALVANIZED AND ENAMELED, WITH PLAIN, PAINTED, GALVANIZED OR MARBLEIZED FRAMES.



CORNER WASH STANDS,

PATENT OVERFLOW, RUBBER PLUG AND BRASS COUPLING.

Plain Slab and Frame	$10 00
Painted Slab and Frame	11 00
Galvanized Slab and Plain Frame	13 00
Enameled Slab and Plain Frame	17 00
Enameled Slab and Bronzed Frame	18 00
Enameled Slab and Marbleized Frame	21 00
Frame—Plain	5 00
Frame—Painted	5 50
Frame—Bronzed	6 00
Frame—Marbleized	9 00

DIMENSIONS.—Height of Slab, 28 inches; Height to top of Back, 34½ inches; Width of Front, 26 inches; Length of Side, 18 inches; Diameter of Bowl, 12 inches.

NOTE.—State, when ordering, whether one or two Faucet Holes are required.

WASH BASINS,

WITH PATENT OVERFLOWS, RUBBER PLUGS AND BRASS COUPLINGS, COMPLETE—PLAIN, PAINTED AND ENAMELED.

WITH OLD STYLE OVERFLOWS—PLAIN, PAINTED AND ENAMELED.

WASH BASINS,

PATENT OVERFLOW AND RUBBER PLUG.

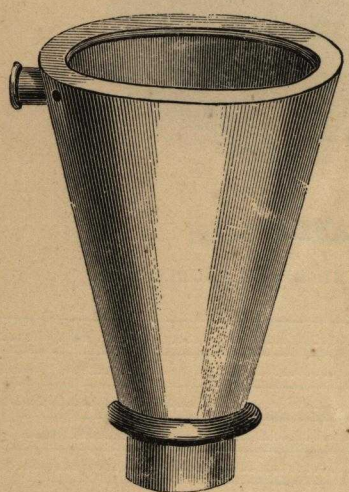
SIZES.	Plain.	Painted.	Enameled.
12 inches	$1 60	1 85	3 00
14 inches	1 90	2 15	3 50
15 inches	2 25	2 50	4 00
16 inches	2 50	2 75	4 50

COMMON OVERFLOW.

SIZES.	Plain.	Painted.	Enameled.
12 inches	$1 25	1 50	2 75
14 inches	1 50	1 75	3 00
15 inches	1 75	2 00	3 50
16 inches	2 00	2 25	3 75

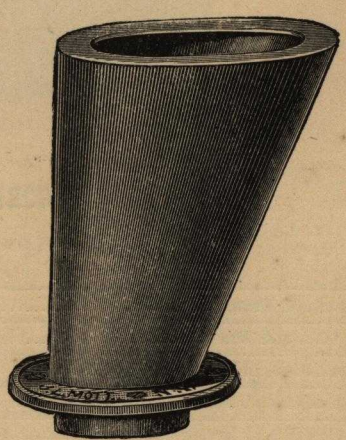
OLD PATTERN HOPPERS,

STRAIGHT ARM—PLAIN, PAINTED AND ENAMELED.



CAR HOPPERS,

SPRINGFIELD PATTERN—PLAIN, PAINTED AND ENAMELED.



OLD PATTERN HOPPERS,

STRAIGHT ARM—PLAIN, PAINTED AND ENAMELED.

Plain	$1 75
Painted	2 00
Enameled	3 00

CAR HOPPERS,

SPRINGFIELD PATTERN—PLAIN, PAINTED AND ENAMELED.

Plain	$2 00
Painted	2 50
Enameled	4 00

S HOPPER TRAPS,

FOR LEAD PIPE CONNECTION.

FOR IRON PIPE CONNECTION.

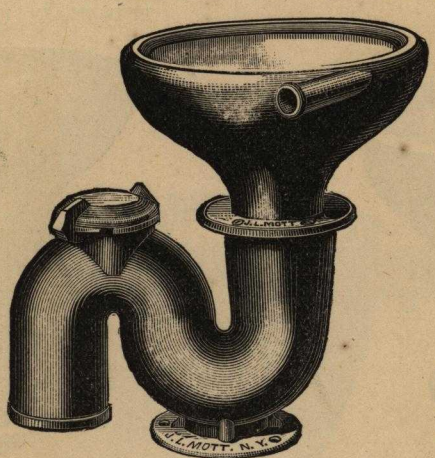
S HOPPER TRAPS.

Size	4 in.
Plain	$ 1 75
Painted	1 85
Enameled	3 00

Traps, with Outlets on Side or Heel, add for Plain, 50c., and for Enameled, 75c.

SHORT HOPPERS.

WITH S TRAP, FOR IRON PIPE CONNECTION. PLAIN, PAINTED AND ENAMELED.



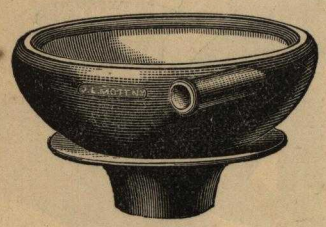
SHORT HOPPERS.

Plain	$ 3 25
Painted	3 60
Enameled Hub and Plain Trap	4 00
Enameled Hub and Enameled Trap	5 25

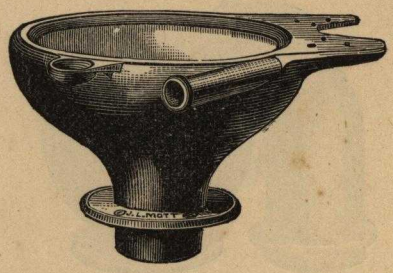
Can be furnished with S, ¾ S or ½ S Traps, and for Lead Pipe Connection.

SHORT HOPPERS,

PLAIN, PAINTED AND ENAMELED.



WITH LUGS FOR SEAT ATTACHMENT AND VALVE ROD—PLAIN, PAINTED AND ENAMELED.



SHORT HOPPERS,

PLAIN, PAINTED AND ENAMELED.

Plain	$1 25
Painted	1 50
Enameled	2 00

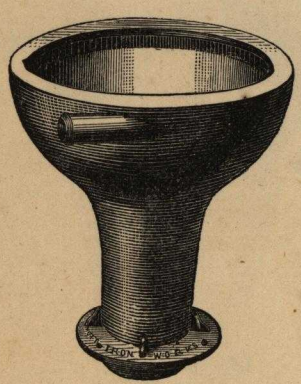
WITH LUGS FOR SEAT ATTACHMENT AND VALVE ROD—PLAIN, PAINTED AND ENAMELED.

Plain	$1 75
Painted	2 00
Enameled	2 75

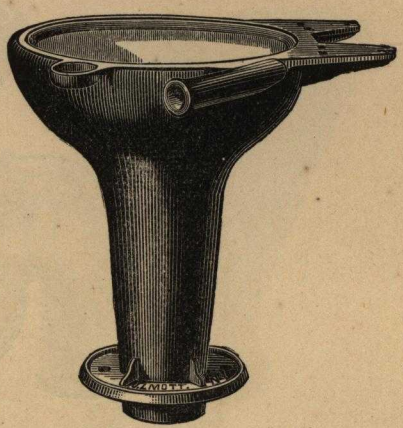
DIMENSIONS —Height, 8 inches; Diameter on top, 14 inches; Outlet, 4 inches.

PHILADELPHIA HOPPERS,

PLAIN, PAINTED AND ENAMELED.



WITH LUGS FOR SEAT ATTACHMENT AND VALVE ROD—PLAIN, PAINTED AND ENAMELED.



PHILADELPHIA HOPPERS,

PLAIN, PAINTED AND ENAMELED.

Plain	$1 25
Painted	1 50
Enameled	2 00

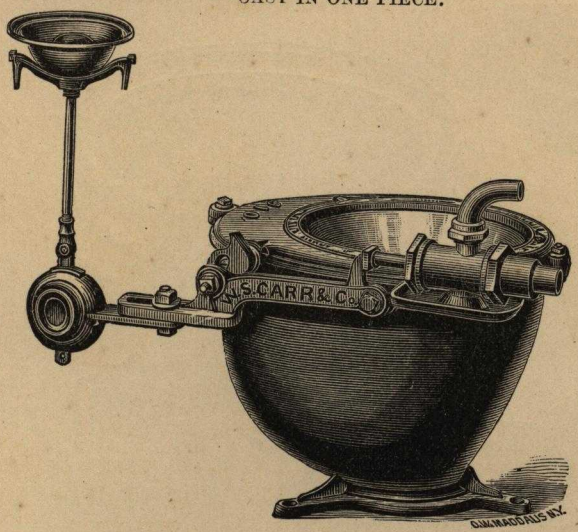
WITH LUGS FOR SEAT ATTACHMENT AND VALVE ROD—PLAIN, PAINTED AND ENAMELED.

Plain	$1 75
Painted	2 00
Enameled	2 75

DIMENSIONS.—Height, 16 inches; Diameter on top, 14 inches; Outlet, 4 inches.

O. I. C. AND I. X. L. VALVE WATER CLOSETS,

CAST IN ONE PIECE.



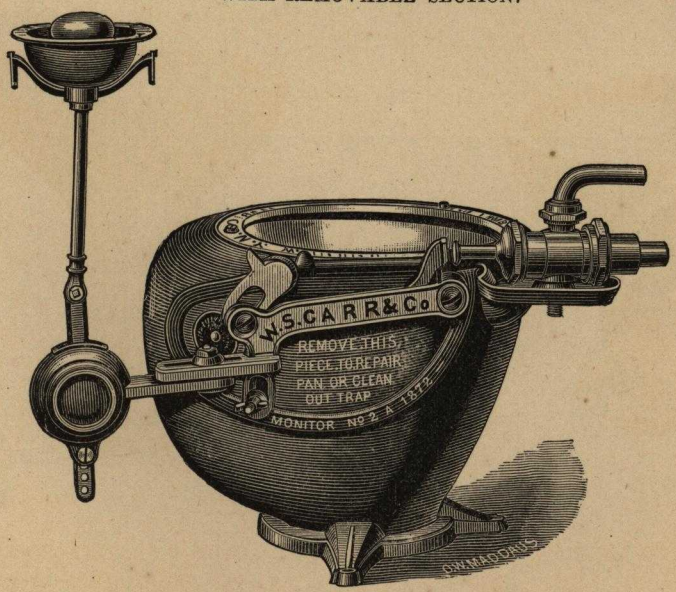
O. I. C. AND I. X. L. VALVE WATER CLOSETS,

CAST IN ONE PIECE.

Carr's O. I. C. Valve Water Closet, Brass Pull and Cup	$ 7 00
I. X. L. Valve Water Closet, Brass Pull and Cup.	7 00
With Plated Cup and Pull Extra	50

MONITOR VALVE WATER CLOSETS,

WITH REMOVABLE SECTION.

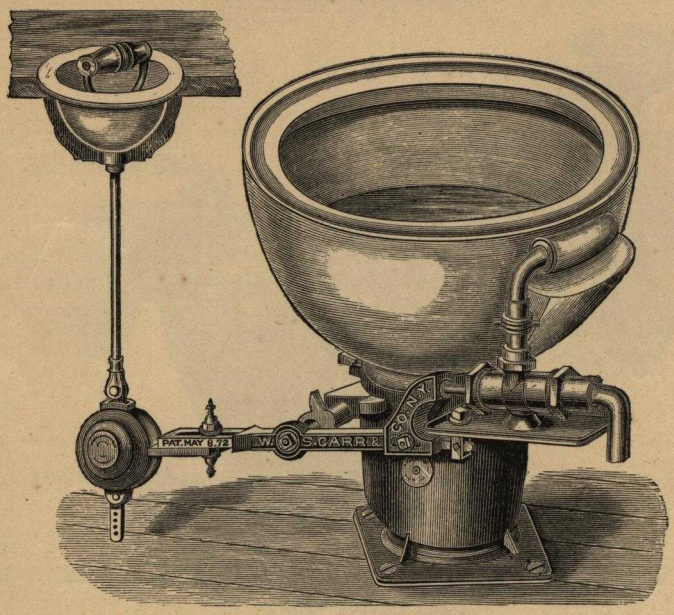


MONITOR VALVE WATER CLOSETS,

WITH REMOVABLE SECTION.

Carr's Monitor Valve Water Closet, Brass Cup and Pull	$9 00
With Plated Cup and Pull Extra	50

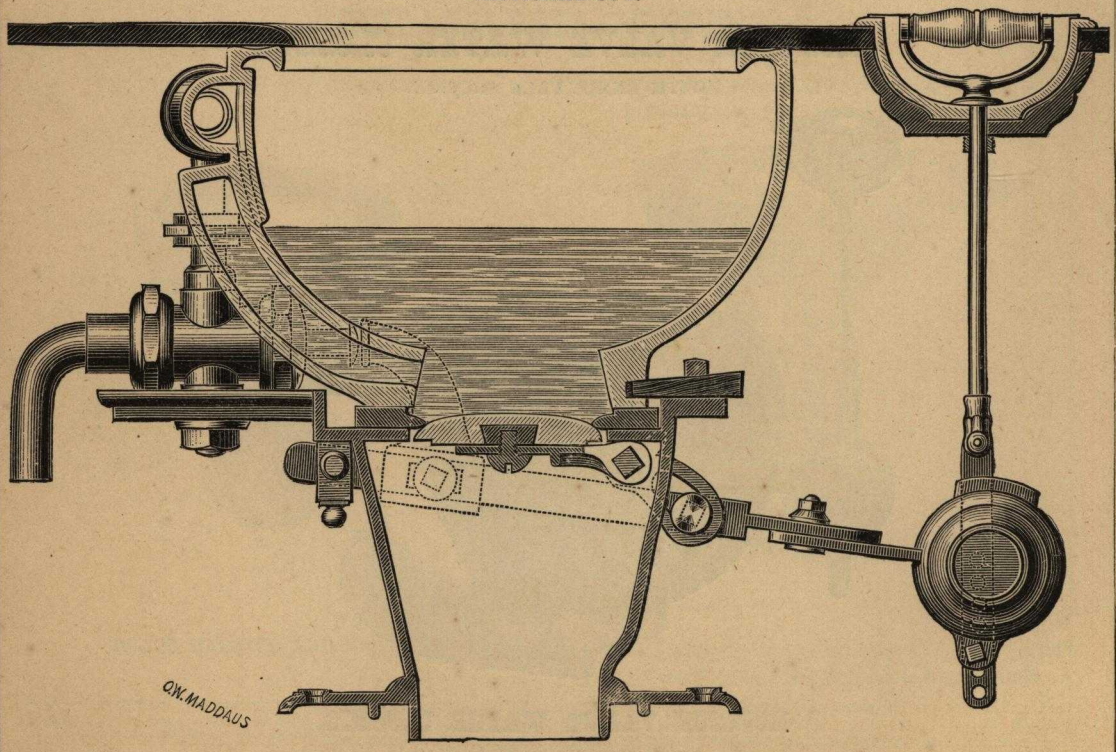
CARR'S PATENT AMERICAN DEFIANCE WATER CLOSETS.



These Closets are expressly for First-Class Buildings (public or private) where cheapness is not the first consideration.

CARR'S PATENT AMERICAN DEFIANCE WATER CLOSETS,

SECTIONAL CUT.

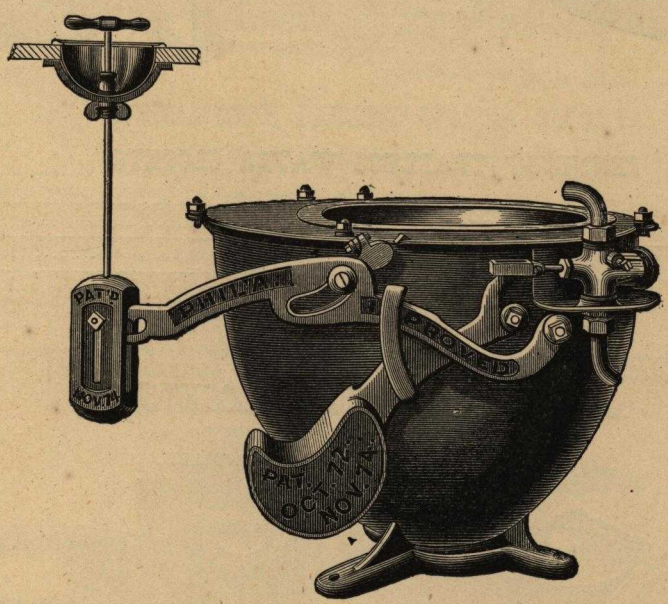


CARR'S PATENT AMERICAN DEFIANCE WATER CLOSETS.

Water Closet, Plated Cup and Pull	$20 00

"PHILADELPHIA" VALVE WATER CLOSETS,

NEW PATTERN.



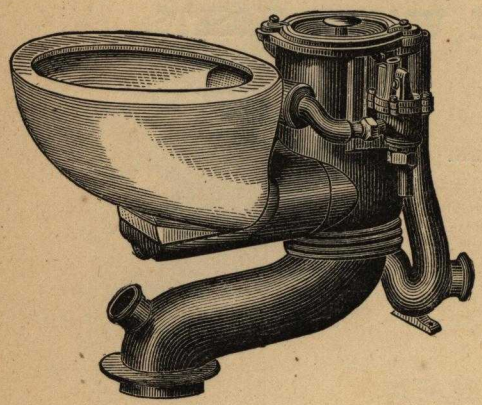
"PHILADELPHIA" VALVE WATER CLOSETS,

NEW PATTERN.

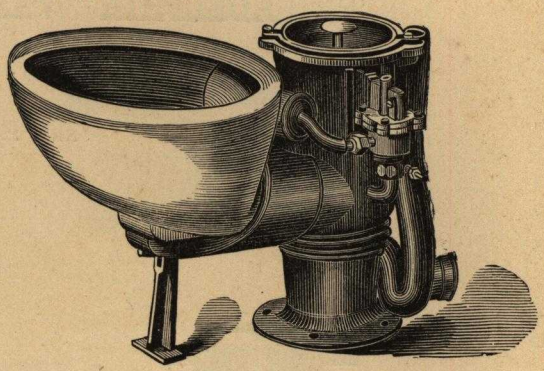
"Philadelphia" Valve Water Closet, with Brass Cup and Pull	$10 00
"Philadelphia" Valve Water Closet, with Plated Cup and Pull	10 50

JENNINGS' TRAPLESS WATER CLOSETS,

WITH OFFSET.



WITHOUT OFFSET.

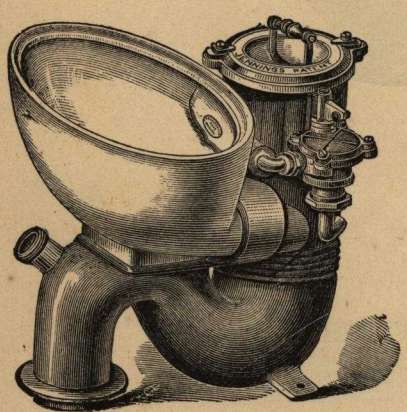


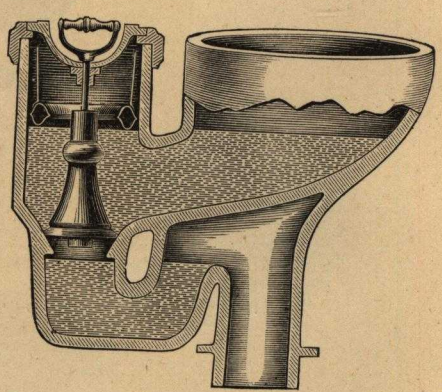
JENNINGS' TRAPLESS WATER CLOSETS.

Jennings' Trapless Water Closets, Without Offset	$25 00
Jennings' Trapless Water Closets, With Offset	26 00

JENNINGS' WATER CLOSETS,

WITH IRON TRAP OR ALL EARTHENWARE.





JENNINGS' WATER CLOSETS,

WITH IRON TRAP.

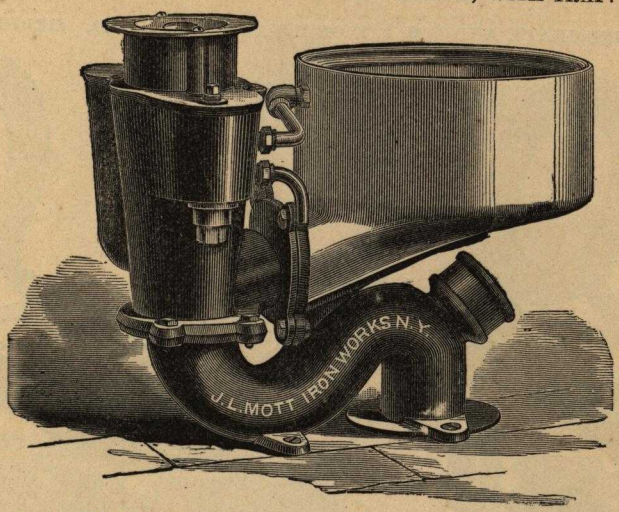
Nickel-Plated Cup and Pull	$ 30 00
Silver-Plated Cup and Pull	31 00

ALL EARTHENWARE.

Nickel-Plated Cup and Pull	$ 35 00
Silver-Plated Cup and Pull	36 00

DEMAREST'S PATENT WATER CLOSETS.

"THE DEMAREST" SIDE OUTLET CLOSET, WITH TRAP.



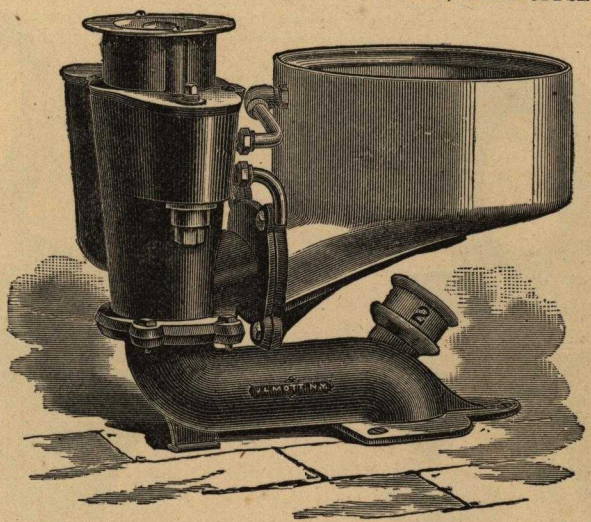
DEMAREST'S PATENT WATER CLOSETS.

"THE DEMAREST" SIDE OUTLET CLOSET, WITH TRAP.

No. 1, Painted Valve Section, with XXX Enameled Bowl	$18 00
No. 1-A, Painted Valve Section, with Porcelain Bowl	20 00
No. 1-B, Enameled Valve Section and Porcelain Bowl	24 00
Extra, if Trap is Enameled	1 50

DEMAREST'S PATENT WATER CLOSETS.

"THE DEMAREST" SIDE OUTLET CLOSET, WITH OFFSET.



DEMAREST'S PATENT WATER CLOSETS.

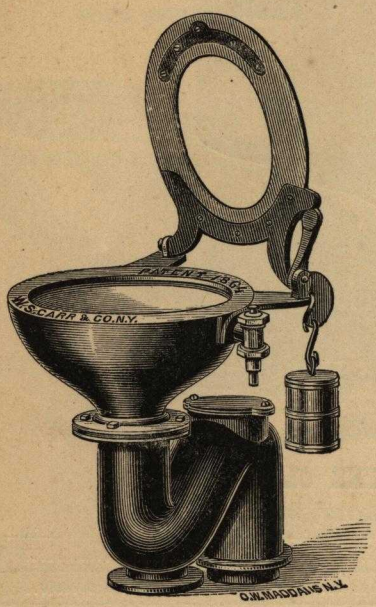
"THE DEMAREST" SIDE OUTLET CLOSET, WITH OFFSET.

No. 2, Painted Valve Section, with XXX Enameled Bowl	$18 00
No. 2-A, Painted Valve Section, with Porcelain Bowl	20 00
No. 2-B, Enameled Valve Section, with Porcelain Bowl	24 00
Extra, if Offset is Enameled	1 50

All furnished with Heavy Cast Brass Nickel-Plated Pull Cups.

CARR'S PATENT HOPPER AND URINAL, COMBINED,

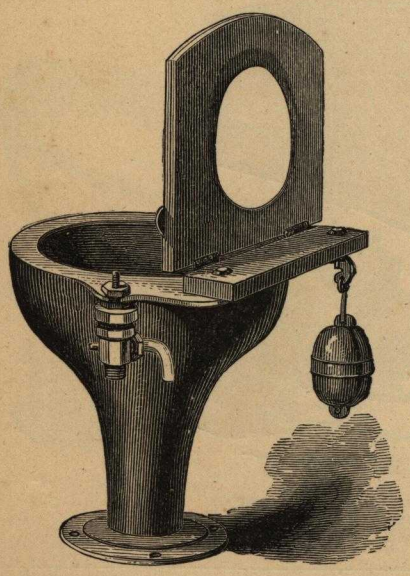
WITH SELF-RAISING SEATS, AND NOS. 9, 10 OR 11 VALVE ATTACHED. HEIGHT, 17 INCHES.



No. 5, Hopper and Urinal, Combined.

No. 5a, Hopper and Urinal, Combined.

Hopper and Urinal, Combined, No. 5	$10 50
Hopper and Urinal, Combined, No. 5a	11 50



No. 6, Hopper and Urinal, Combined.

No. 6a, Straight Back Hopper and Urinal, Combined.

Hopper and Urinal, Combined, No. 6	$ 9 50
Hopper and Urinal, Combined, No. 6a	10 50

CARR'S PATENT PRISON HOPPER AND URINAL, COMBINED.

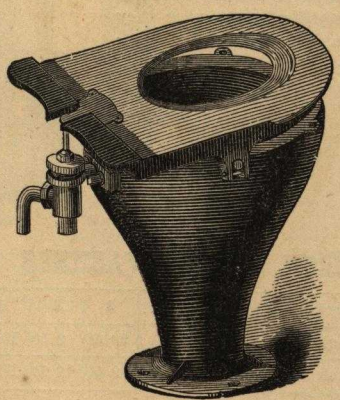
CARR'S PATENT PRISON HOPPER AND URINAL, COMBINED,

WITHOUT WASH BASIN AND SELF-CLOSING BIBB. MADE WITH FULL S, ½ S OR ¾ S TRAPS. TAPPED RIGHT OR LEFT FOR IRON PIPE CONNECTIONS FROM WASH BASIN.

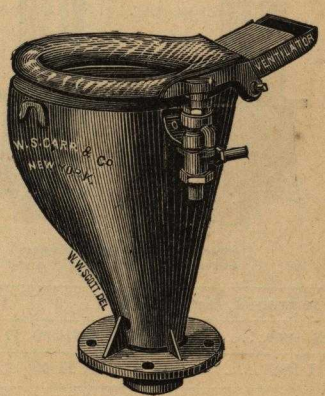
Carr's Patent Prison Hopper and Urinal, Combined, without Wash Basin or Cock	$10 50

HOSPITAL HOPPER CLOSETS,

WITH No. 9, 10 OR 11 VALVE ATTACHED. HEIGHT, 17 INCHES.



No. 7.



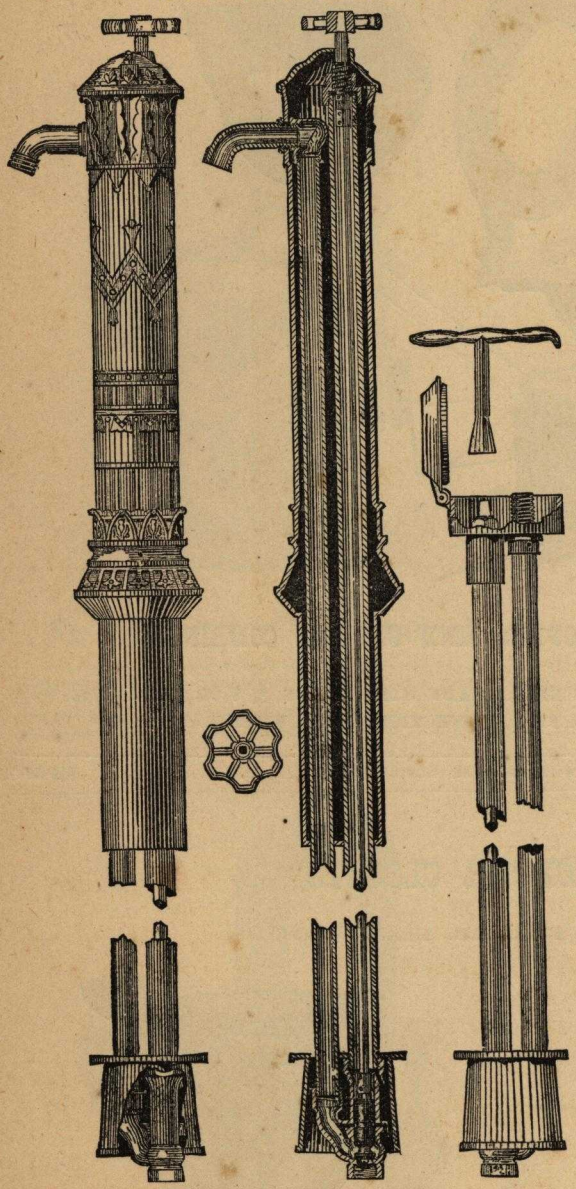
No. 7a,

WITH VENTILATION PIPE.

Hospital Hopper Closet, No. 7	$15 00
Hospital Hopper Closet, No. 7a	17 00

McNamara's Patent Compression Valve Dry Pipe Hydrant and Street Washer,

WITH IMPROVED ORNAMENTAL POST.



This Hydrant and Street Washer has the advantage over all others from the fact that all the working parts are in a Dry Pipe, which is thoroughly protected both at the top and bottom, so that water cannot enter it, thus avoiding the possibility of frost affecting it in any manner in the coldest weather.

The working of this Hydrant and Street Washer are so plainly shown by the accompanying cuts that further explanation is unnecessary. The following are the principal advantages claimed in the use of these Hydrants and Street Washers:

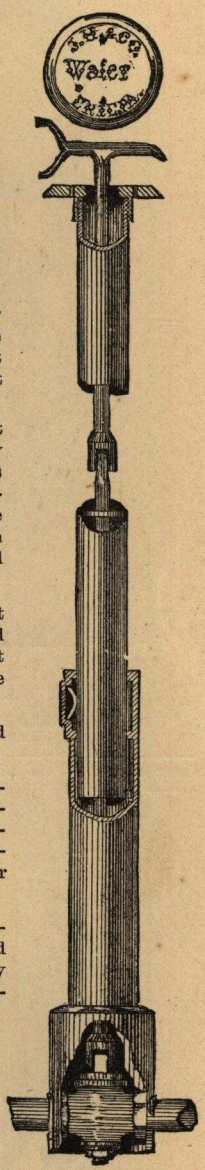
1st. They are not liable to get out of order, but in case of needed repairs it can be done without digging up or removing the Pipe or Stock from the ground.

2d. They are made of Iron and Brass, and so cannot rot out.

3d. They are perfectly anti-freezing. The waste being automatic and operating with certainty so that no water can remain in the pipes when the water is shut off.

4th. They are positive in operation, simple in construction, and for durability and service they will stand extreme water pressures.

Jarecki's Shut-Off Box.



IRON HYDRANTS.

Length in ground, feet	3	4	5	6
Price, ¾ inch	$10 50	11 00	12 00	14 00
Price, 1 inch	11 50	12 50	13 00	15 00

IRON STREET WASHERS.

Length in ground, feet	3	4	5	6
Price, ¾ inch	$8 50	9 50	10 50	12 00
Price, 1 inch	9 50	10 50	11 50	13 00

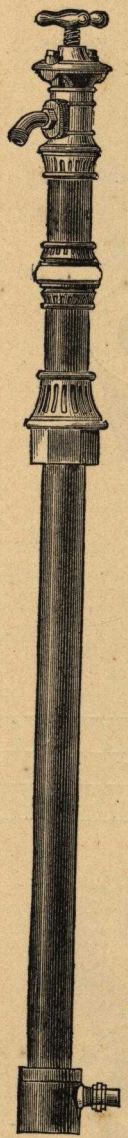
For Iron Pipe Connection, add $1.00 extra.

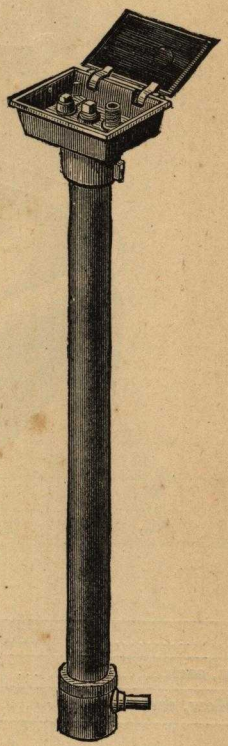
JARECKI'S SHUT-OFF BOX.

Price, 3 feet long	$ 3 00
Price, 4 feet long	3 50

ST. LOUIS PATENT HYDRANTS AND STREET WASHERS,

ANTI-FREEZING.





These Hydrants are anti-freezing, very simple in construction, neat in design, and can be repaired at any time without digging up the Stock.

O. K. HYDRANTS.

Length, feet	3	4	5	6
Price, ¾ inch	$10 00	11 00	12 00	13 00
Price, 1 inch	11 00	12 00	13 00	14 00

Self-Closing, add $2.00 extra.

O. K. STREET WASHERS.

Length, feet	3	4	5	6
Price, ¾ inch	$ 8 50	9 50	10 50	11 50
Price, 1 inch	9 50	10 50	11 50	12 50

For Iron Pipe, add $2.00 to above List.

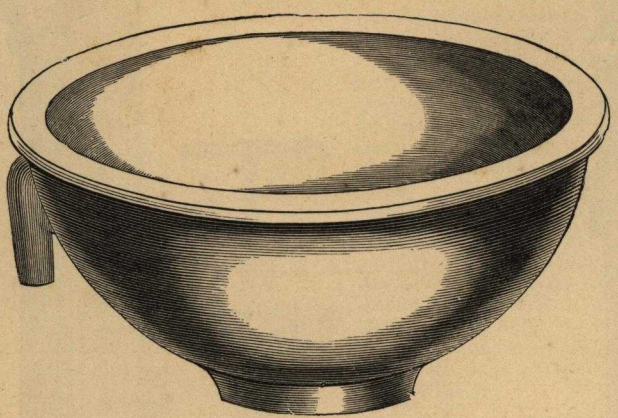
PLUMBERS' EARTHENWARE.

T. C. BROWN WESTHEAD, MOORE & CO.

L. M. RUMSEY MFG. CO., Importers and Sole Western Agents.

WHITE WASH BASINS,

COMMON OVERFLOW.

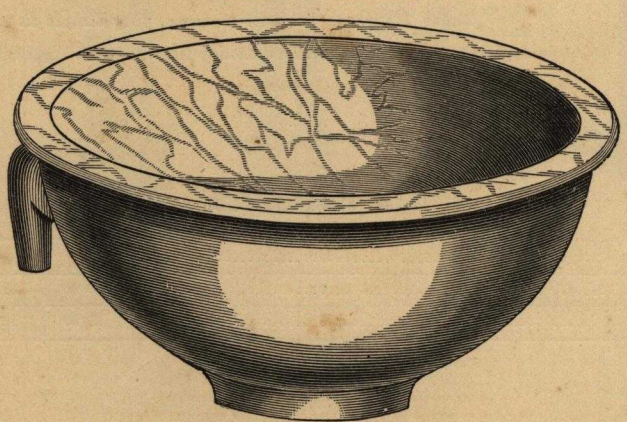


WHITE WASH BASINS.

Size	12	13	14	15	16 in.
With Overflow, each	$1 20	1 30	1 50	2 00	2 60
Without Overflow, each	1 10	1 20	1 40	1 90	2 50

MARBLED WASH BASINS,

COMMON OVERFLOW.



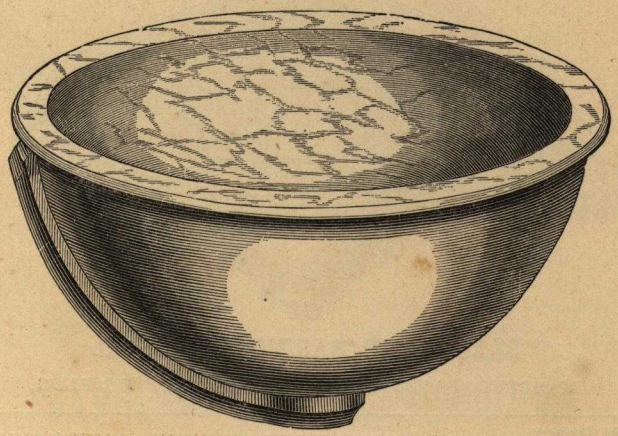
MARBLED WASH BASINS.

Outside Measure	9	10	11	12	13	14	15	16	17	18	19	20 in.
With Overflow, each	$1 15	1 20	1 30	1 45	1 55	1 70	2 40	3 00	5 00	6 00	7 00	8 00

Without Overflow, all 10 cents less.

MARBLED WASH BASINS,

PATENT OVERFLOW.

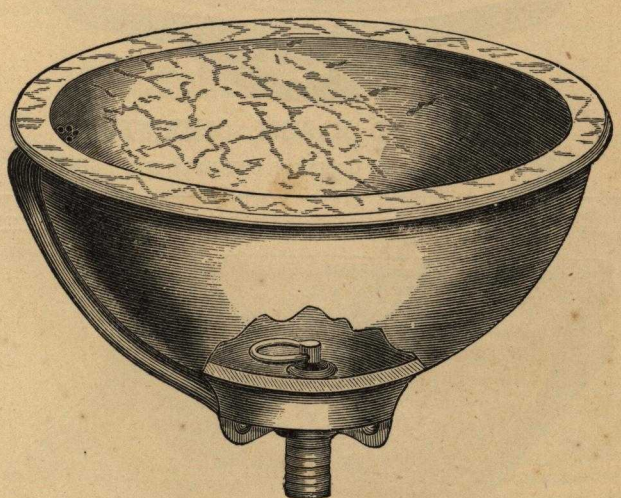


PATENT OVERFLOW BASINS.

Outside Measure	12	13	14	15	16 in.
Marbled, each	$ 1 75	1 90	2 20	2 75	3 25
White, each	1 45	1 60	1 80	2 40	2 85

MARBLED WASH BASINS,

PATENT OVERFLOW AND RUBBER PLUG.



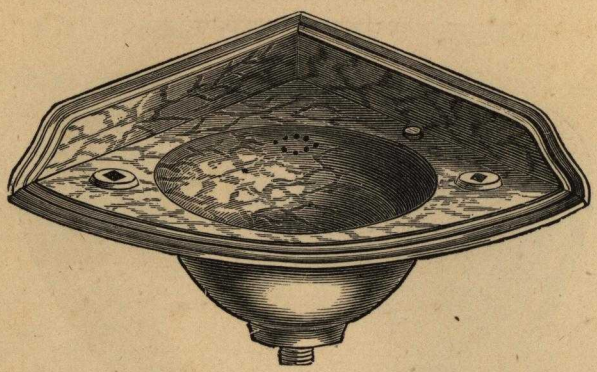
MARBLED WASH BASINS,

PATENT OVERFLOW AND RUBBER PLUG.

Outside Measure	12	13	14	15	16 in.
Marbled, each	$ 1 90	2 10	2 30	3 00	3 50
Fancy, each	5 25	5 50	6 25	7 00	8 75

SLABS AND BASINS, COMBINED,

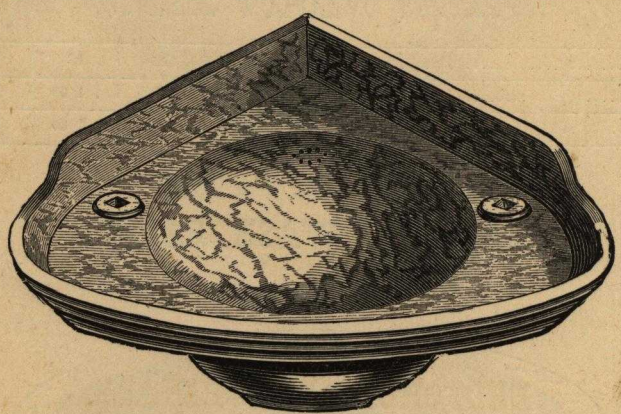
PATENT OVERFLOW FOR RUBBER PLUG.



SLABS AND BASINS, COMBINED,

MARBLED, PATENT OVERFLOW FOR RUBBER PLUG.

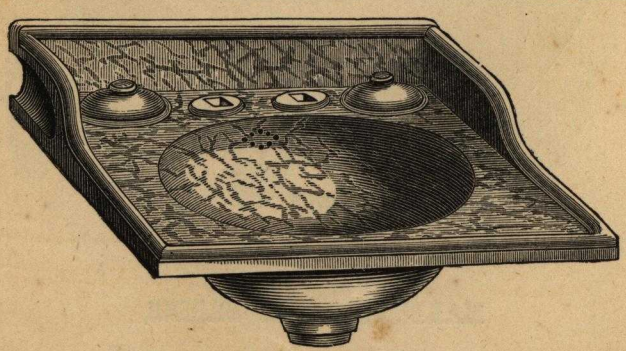
No. 1, Corner, Size 19x19 inches	$10 25
No. 5, Corner, Size 12x14 inches	6 50



SLABS AND BASINS, COMBINED,

MARBLED, COMMON OVERFLOW.

No. 7, Corner, Size 28x20 inches	$13 75



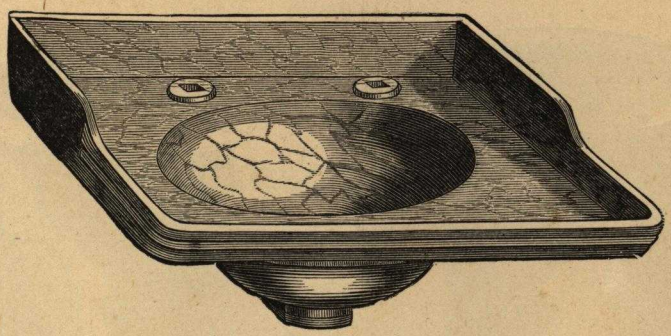
SLABS AND BASINS, COMBINED.

MARBLED, PATENT OVERFLOW FOR RUBBER PLUG.

No. 3, Square, Size 18x18 inches	$10 25
No. 6, Square, Size 12x12 inches	6 50

SLABS AND BASINS, COMBINED,

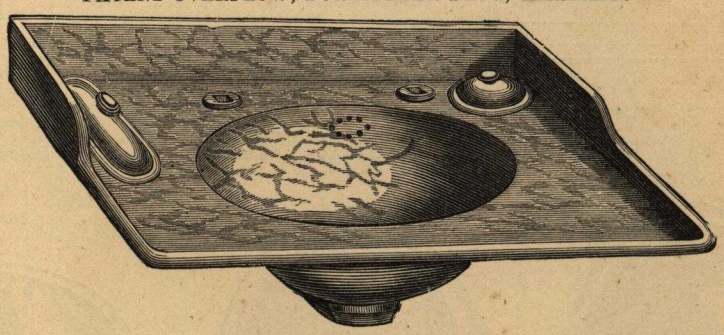
COMMON OVERFLOW, MARBLED.



No. 8, Oblong. Size, 18 x 24 inches	$ 13 75

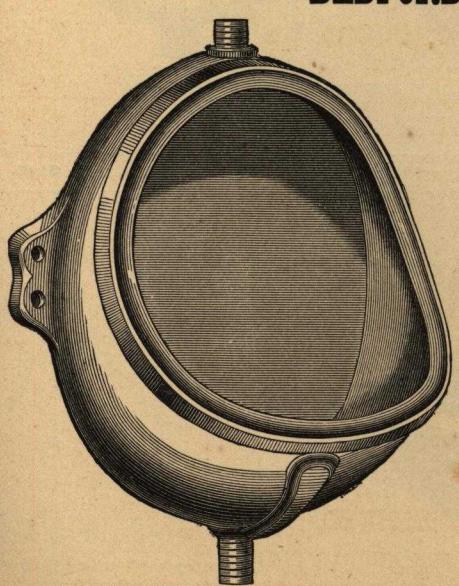
SLABS AND BASINS, COMBINED,

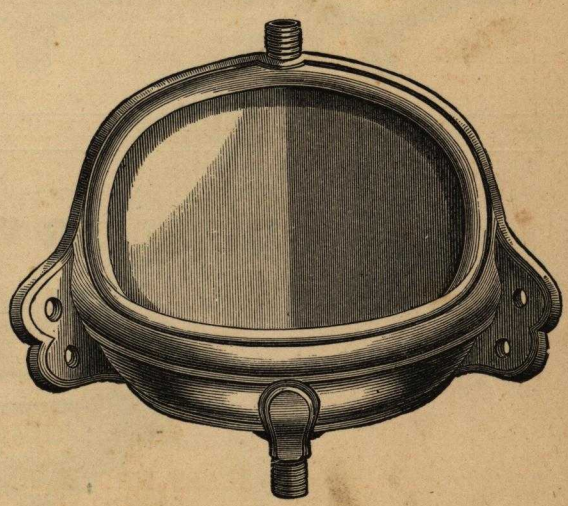
PATENT OVERFLOW, FOR RUBBER PLUG, MARBLED.



No. 4, Oblong. Size, 17 x 24 inches	$18 50

BEDFORDSHIRE URINALS.

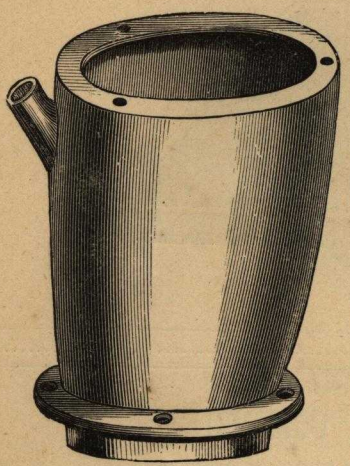


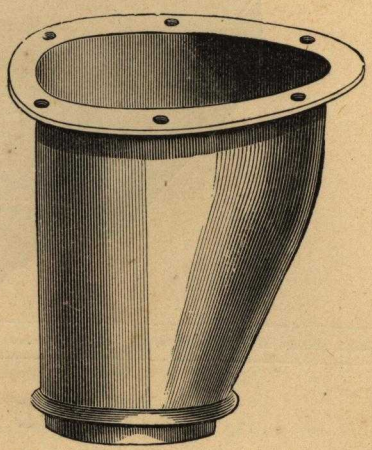


Large Size, 15½ x 18½ inches	$7 50
Small Size, 12½ x 16½ inches	6 50

Large Size, 12½ x 16½ inches	$ 7 50
Small Size, 10 x 14 inches	6 50

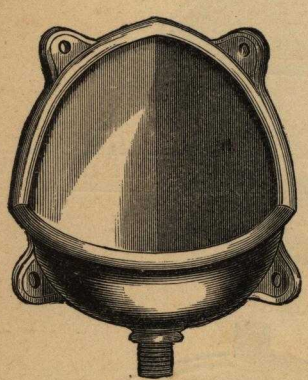
RAILROAD CAR HOPPERS.

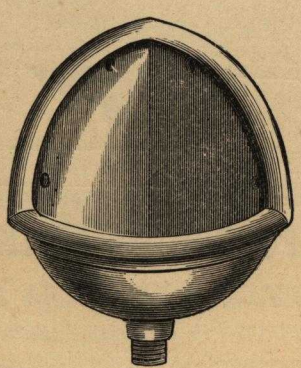


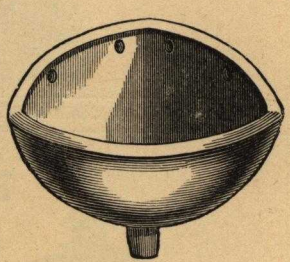


Price	$6 50	Price	$6 50

RAILROAD CAR URINALS.

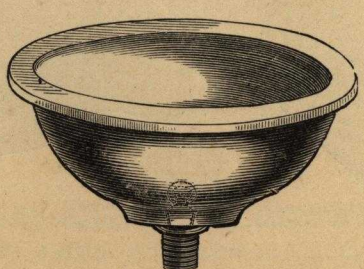






Price	$5 00	Price	$4 75	Price	$4 00

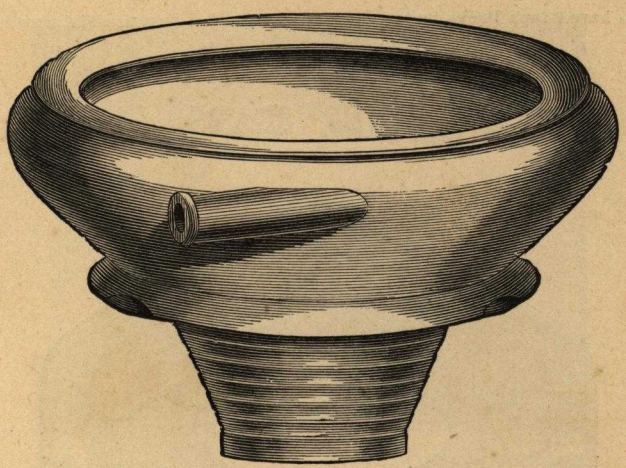
RAILROAD CAR WASH BASINS.



Size, 14 inches Outside, 11 inches Inside Measure. Price	$2 50

CLOSET BASINS,

FRENCH.

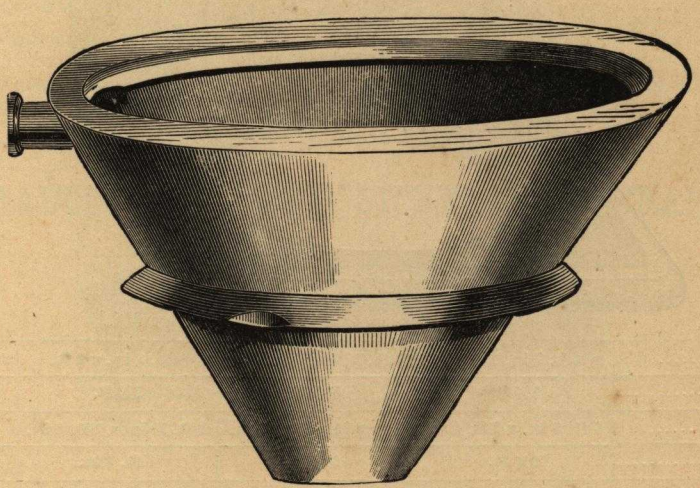


CLOSET BASINS, FRENCH.

French Pattern, White	$ 2 20
French Pattern, Marbled	3 75
French Pattern, Blue	3 75
French Pattern, Fancy	8 75

CLOSET BASINS,

OVAL.



CLOSET BASINS, OVAL.

Oval Pattern, White	$ 2 20
Oval Pattern, Marbled	3 75
Oval Pattern, Blue	3 75
Oval Pattern, Fancy	8 75

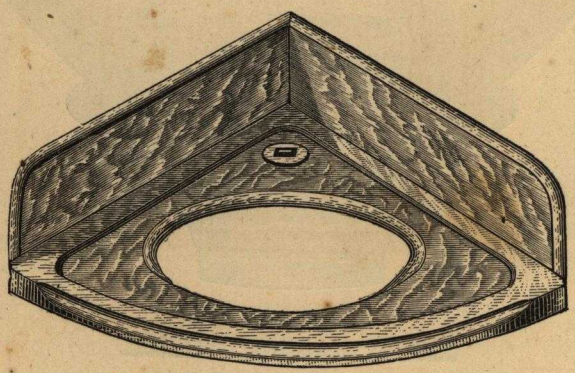
PLUMBERS' SLABS,

OF ITALIAN OR AMERICAN MARBLE.

All Slabs to have 8-inch Backs, unless otherwise ordered. Any size Slabs made to Order.

CORNER SLABS,

TWO BACKS.

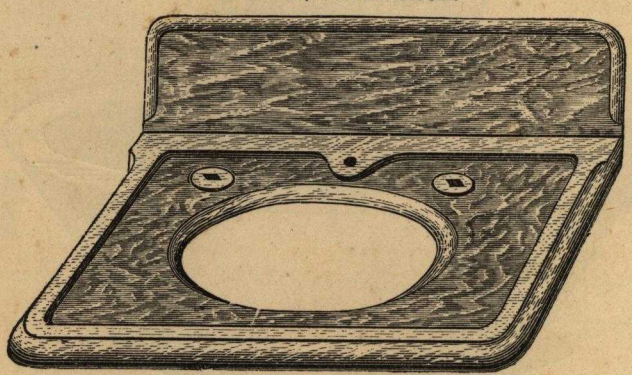


Size of Slabs	18 in.	19 in.	20 in.	21 in.	22 in.	24 in.
Feet in Slabs	4 ft. 10 in.	5¼ ft.	5¾ ft.	6¼ ft.	6½ ft.	7½ ft.

18 and 19 in. are for 13 in. Bowl.

SQUARE SLABS,

SINGLE, 8-INCH BACK.



Size of Slabs	1 ft. 7 in. x 2 ft.	1 ft. 7 in. x 2 ft. 2 in.	1 ft. 8 in. x 2 ft.	1 ft. 8 in. x 2 ft. 2 in.
Feet in Slabs	5¼ ft.	5⅔ ft.	5⅔ ft.	6 ft.
Size of Slabs	1 ft. 8 in. x 2 ft. 4 in.	1 ft. 8 in. x 2 ft. 6 in.	1 ft. 10 in. x 2 ft. 6 in.	1 ft. 10 in. x 3 ft.
Feet in Slabs	6⅓ ft.	6⅔ ft.	7 ft. 1 in.	8⅓ ft.

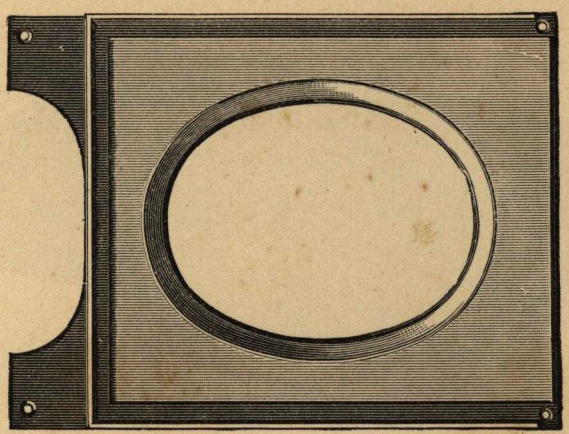
SQUARE SLABS,

WITH BACK. EITHER WITH RIGHT OR LEFT HAND END.

Size of Slabs.	1 ft. 8 in. x 2 ft. 4 in.	1 ft. 8 in. x 2 ft. 6 in.	1 ft. 10 in. x 2 ft. 6 in.	1 ft. 10 in. x 3 ft.
Feet in Slabs	7½ ft.	7¾ ft.	8 ft. 2 in.	9⅔ ft.

In ordering, state Marble wanted, whether Countersunk or Plain, or with one or two Cock Holes, or Chain Stay and for what size Basin. Backs can be made of any heighth.

FRANCESTOWN SOAP STONE SLABS AND BOILER TOPS.

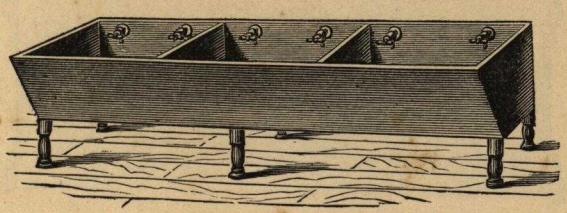


SOAP STONE SLABS AND BOILER TOPS.

⅝ inch thick, per superficial foot	$ 34
¾ inch thick, per superficial foot	37
1 inch thick, per superficial foot	44
1¼ inch thick, per superficial foot	50
1½ inch thick, per superficial foot	58
1¾ inch thick, per superficial foot	63
2 inch thick, per superficial foot	70
2½ inch thick, per superficial foot	85
3 inch thick, per superficial foot	1 00
3½ inch thick, per superficial foot	1 15
4 inch thick, per superficial foot	1 33

Other sizes and dimensions, as ordered. All Stone, 6 feet and under 8 feet in length, 10 cents per foot extra; 8 feet long and over, 20 cents per foot extra.

FRANCESTOWN SOAP STONE WASH TRAYS.

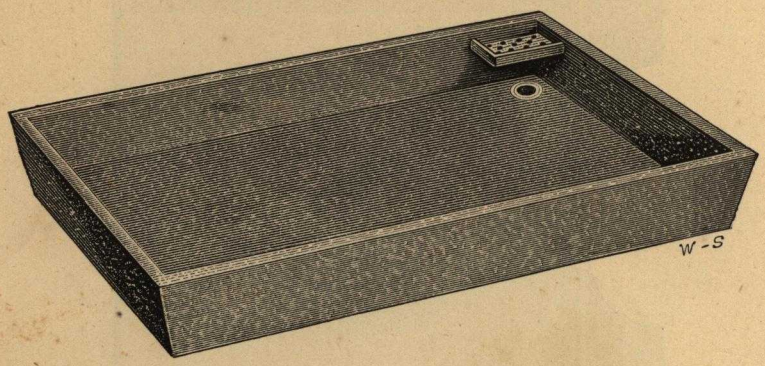


FRANCESTOWN SOAP STONE WASH TRAYS.

2 parts plain, length, 4 feet; width, 2 feet; depth, 12 inches	$22 00
2 parts polished	25 00
3 parts plain	34 00
3 parts polished	38 00

Other sizes, as may be ordered, per superficial foot—Plain, $1.00; Polished, $1.10.

FRANCESTOWN SOAP STONE SINKS.



FRANCESTOWN SOAP STONE SINKS.

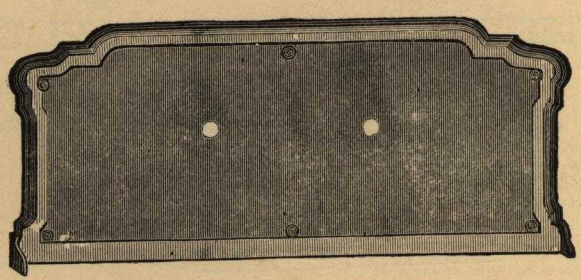
3 foot Sink, plain, 20 inches wide	$10 00
3 foot Sink, polished, 20 inches wide	11 50
3½ foot Sink, plain, 22 inches wide	12 25
3½ foot Sink, polished, 22 inches wide	13 50
4 foot Sink, plain, 24 inches wide	15 00
4 foot Sink, polished, 24 inches wide	16 50

Other sizes, per superficial foot—Plain, $1 00; Polished, $1 10.

WATER TANKS.

Water Tanks, per superficial foot	$1 00

FRANCESTOWN SOAP STONE SINK BACKS.

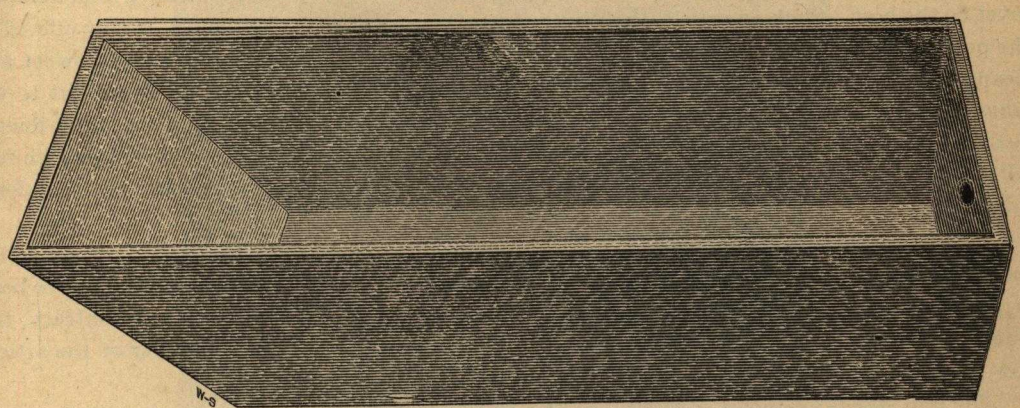


FRANCESTOWN SOAP STONE SINK BACKS.

Description	Plain.	Polished.	Polished, O. G. Edge.
Sink Backs, per foot	$1 00	1 10	1 20
Draw Board, per foot	1 00	1 10	1 20

For price of Soap Stone Sinks, with Backs and Draw Board, add the price of Backs and Draw Board to the List price of Sinks.

FRANCESTOWN SOAP STONE BATH-TUBS.



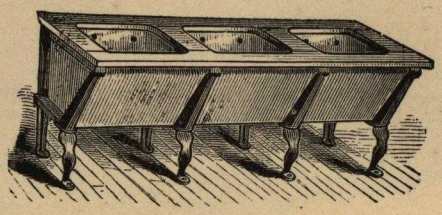
PRICE LIST.

Length, 5 feet, width, 2 feet, depth, 18 inches; per superficial foot	$1 00
Length, 5½ feet width, 2 feet; depth, 18 inches; per superficial foot	1 00
Length, 6 feet width, 2 feet depth, 20 inches; per superficial foot	1 00
Boxing, extra	2 00

Can be furnished of any length and depth.

SOLID CROCKERY WASH-TUBS,

SHOWING THREE TUBS, SET UP ON IRON STANDS, WITH WOOD TOP.



These Tubs are the only perfect stationary Wash-Tubs, and they are absolutely warranted against breaking by either heat, cold or accident.

It is obvious that a stationary Tub, which is made in one piece, with no seams to open, of a material unaffected by any extreme of temperature, non-absorbent, and practically imperishable, must be the best. Such an article, the result of many years of persistent effort, is now offered to the public. Made of white crockery, of strength nearly equivalent to iron, always sweet and clean, and warranted to withstand the roughest domestic usage, they are an ornament to the laundry and a source of unfailing satisfaction to the owner. Already many of the finest houses in the country are supplied with them, and it is certain that henceforth no first-class architect will include any other tubs in his specifications. All architects who have seen them, endorse them fully.

They are especially valuable for apartment houses and all buildings where tubs are set above the basement, as they have no seams, and consequently can never leak. These Tubs have been in practical use eight years, and there has been no instance of failure. On the contrary, the oldest purchasers are as enthusiastic about them as the latest, although the quality of the article now produced is greatly superior to that first supplied.

The iron stands are not a necessity, as the Tubs can be set up by any carpenter, the same as soapstone or wood, at very trifling cost.

One Tub in each set has a corrugated surface moulded on the inside front, forming an unequaled "washboard," and all have recesses for soap in one corner. They are made in three styles, one with two holes in the back for faucets, another with one hole in the back for overflow, and another entirely plain—the latter admitting of more economy in plumbing, and greatly increasing the capacity of the Tubs, the water being drawn from above, as in bath-tubs.

DIMENSIONS OF TUBS.—Outside measurement, 29 inches long, 25 inches front to back, and 16 inches deep; and three set up as shown in the cut, require a space of 7 feet 5 inches. Weight of set of three, complete, about 500 pounds. Single Tub, 120 pounds.

PRICE LIST.

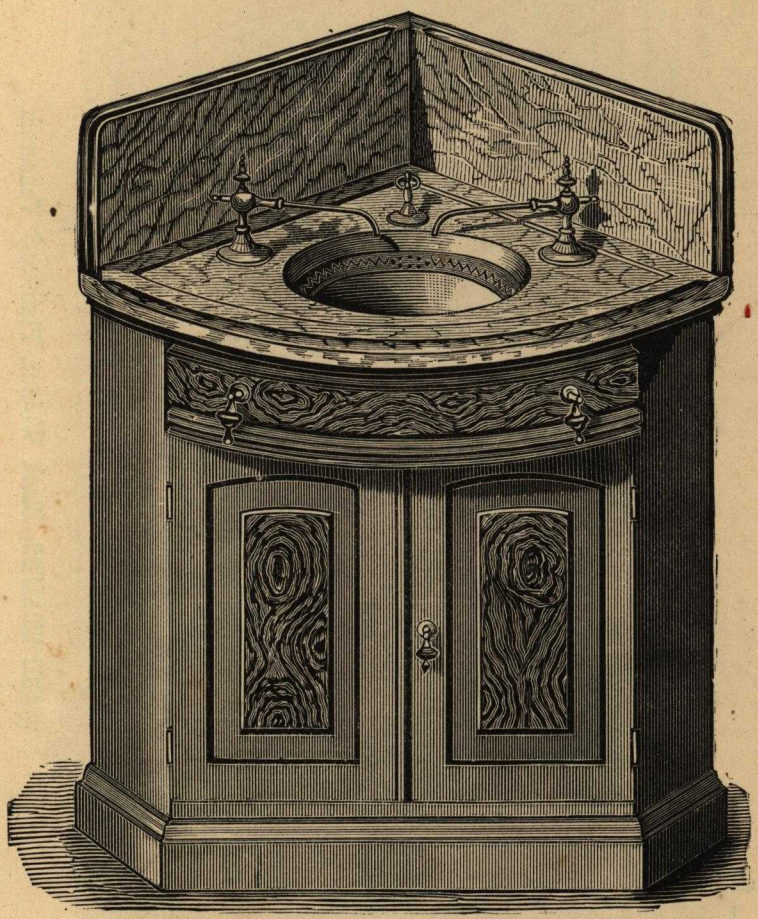
One Tub, without fixtures	$20 00
Galvanized iron stands, per set of 2 Tubs	8 25
Galvanized iron stands, per set of 3 Tubs	11 00
Galvanized iron stands, per set of 4 Tubs	13 75
Heavy ash top, per set of 2 Tubs	2 75
Heavy ash top, per set of 3 Tubs	4 00
Heavy ash top, per set of 4 Tubs	5 25

Larger sets in proportion.

PLUMBERS' CABINET WARE.

CORNER WASH STANDS,

BLACK WALNUT, PLAIN AND VENEERED.



CORNER WASH STANDS,

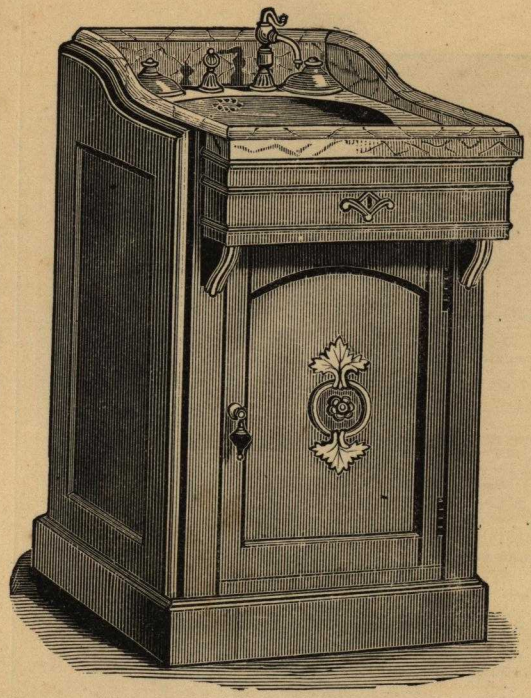
BLACK WALNUT, PLAIN AND VENEERED.

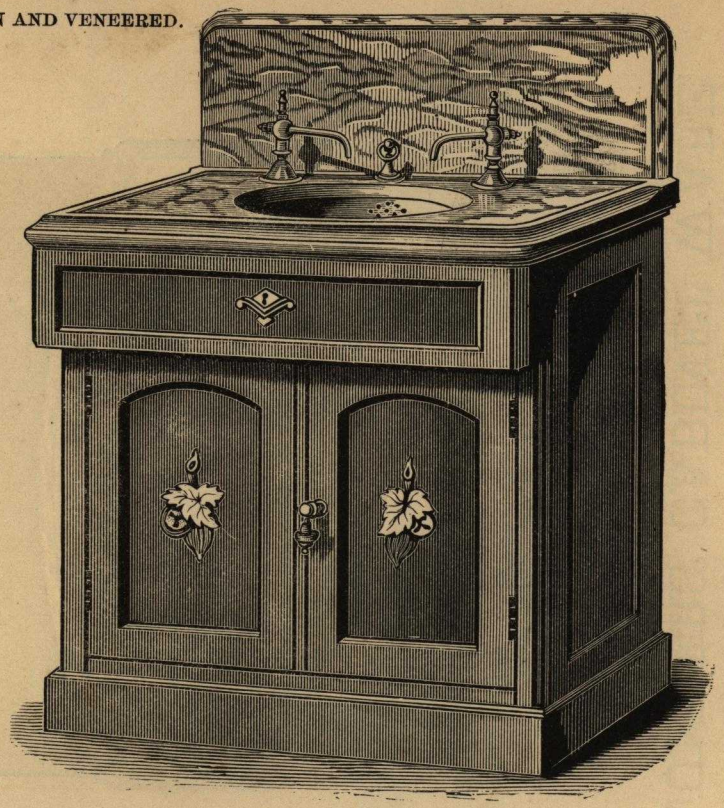
Size of Marble Slabs	22 x 22	22 x 24
Price Plain Black Walnut Frame	$16 00	16 00
Price Veneered Walnut Frame	18 00	18 00

Marble Slabs, extra.

WASH STANDS,

BLACK WALNUT, PLAIN AND VENEERED.





WASH STANDS, Black Walnut, Plain and Veneered.

Size of Slabs	20 x 19	26 x 18
Price Plain Walnut Frame	$14 00	14 00
Price Veneered Walnut Frame	16 00	16 00

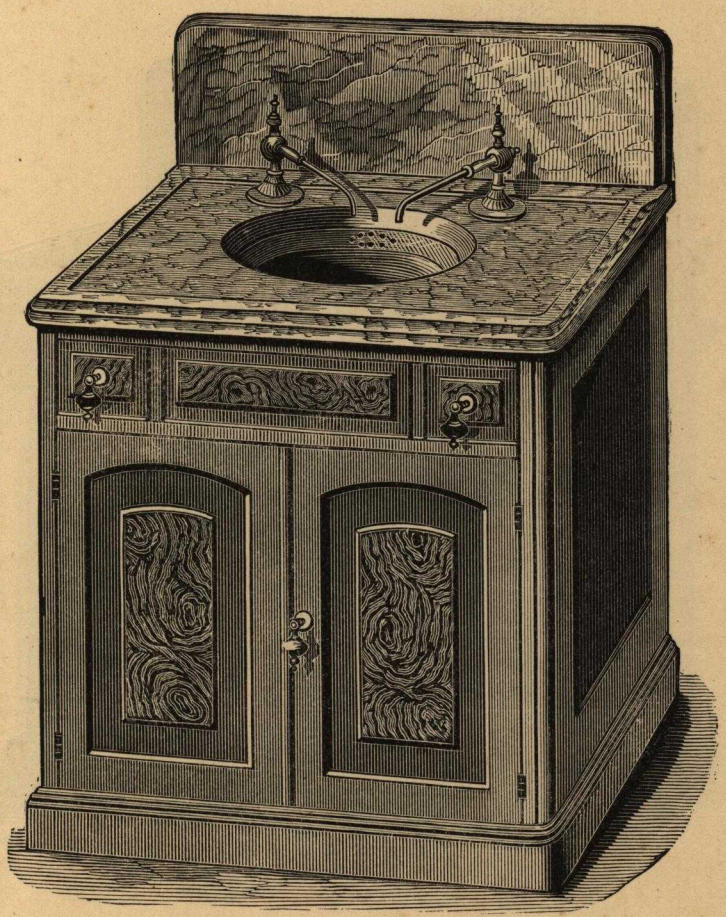
Marble or Earthenware Slabs, extra.

Size of Marble Slabs	27 x 20	30 x 20
Price Plain Walnut Frame	$14 00	14 00
Price Veneered Walnut Frame	16 00	16 00

Marble Slabs, extra.

CORNER WASH STANDS,

BLACK WALNUT, PLAIN AND VENEERED.



CORNER WASH STANDS,

BLACK WALNUT, PLAIN AND VENEERED.

Size of Marble Slabs	30 x 20
Price Plain Walnut Frame	$16 50
Price Veneered Walnut Frame	19 00

Marble Slabs, extra.

WASH STANDS,

BLACK WALNUT.

WASH STANDS,

BLACK WALNUT.

Size of Marble Slab	26x18	27x20	30x20	33x20
Price Plain Walnut Frame	$17 50	17 50	19 00	20 00
Price Veneered Walnut Frame	20 00	20 00	22 00	24 00

Marble Slabs, extra.

WASH STANDS,

BLACK WALNUT.

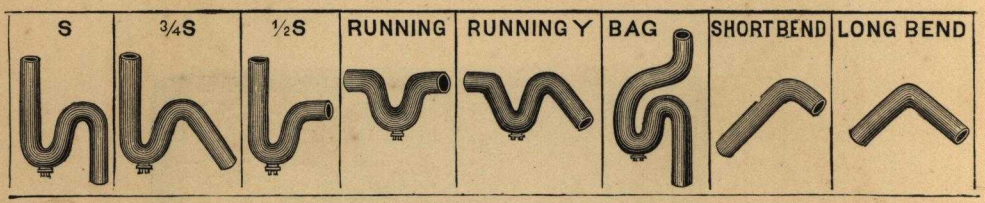
WASH STANDS,

BLACK WALNUT.

Size of Marble Slabs	33x20	36x20
Price Plain Walnut Frame	$25 00	31 00
Price Veneered Walnut Frame	31 50	37 50

Marble Slabs, extra.

THE "DU BOIS" LEAD TRAPS AND BENDS.



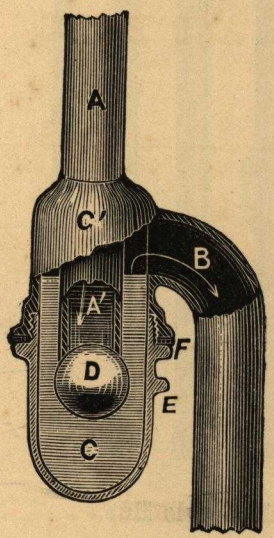
THE "DU BOIS" LEAD TRAPS AND BENDS.

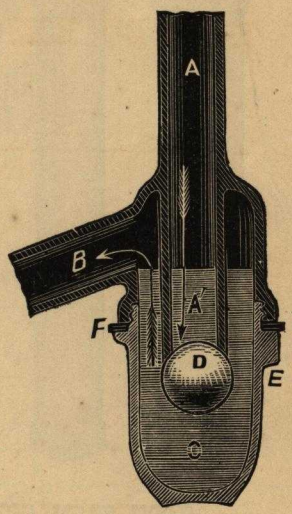
	EXTRA HEAVY, 8 LB. LEAD.				SPECIAL 5½ LB.	STANDARD WEIGHT, 6 LB. LEAD.					
Size	4½	4	3	2	4	4½	4	3	2	1¼	1¼ in
Full S	$4 25	3 25	2 30	1 60	1 90	3 25	2 20	1 70	1 10	0 80	0 65
¾ S	4 25	3 25	2 30	1 60	1 90	3 25	2 20	1 70	1 10	80	65
Half S	3 25	2 50	1 85	1 20	1 55	2 50	1 70	1 35	1 00	70	55
Running	3 40	2 60	2 00	1 25	OTHER SHADES NOT MADE.	2 60	1 85	1 50	1 05	75	60
Running Y	4 25	3 25	2 30	1 60		3 25	2 20	1 70	1 10	80	65
Bag	6 75	5 00	4 60	2 20		5 00	4 60	3 40	2 00	1 60	1 25
Long Bend	2 60	2 00	1 35	1 10		2 00	1 35	1 00	55	45	40
Short Bend	2 00	1 50	1 00	80		1 50	90	75	45	40	30

The above Prices include Brass Drain Screws for all Traps excepting the 4½ inch and 4 inch sizes.

These Traps are made in the same manner as Lead Pipe; they have NO SEAM, are of UNIFORM THICKNESS, perfectly smooth inside and outside, and can be READILY FLANGED AND PLUGGED WITHOUT FEAR OF CRACKING. No danger of holes so likely to be found in CAST TRAPS.

THE BOWER PATENT SEWER GAS TRAP.





EXPLANATION.—AA, Inlet from Wash-stand. B, Outlet to Sewer CC, Cup-shaped Chamber. D, Floating Valve. E, Lug to unscrew Cup. F, Rubber Gasket.

THE BOWER PATENT SEWER GAS TRAP.

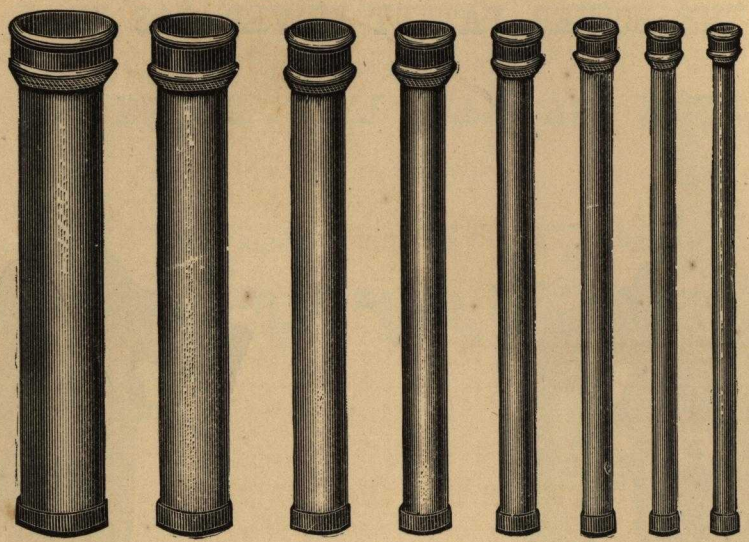
SIZE.		FULL S.				HALF S.				RUNNING.			
INLET.	OUTLET.	LEAD & GLASS.		ALL LEAD.		LEAD & GLASS.		ALL LEAD.		LEAD & GLASS.		ALL LEAD.	
		No.	Price.	No.	Price.	No.	Price.	No.	Price.	No.	Price.	No.	Price.
1 in.	1¼ in.	1	$1 00	2	$1 20	3	$ 95	4	$1 15				
1¼ "	1¼ "	5	1 05	6	1 25	7	1 00	8	1 20	9	$1 10	10	$1 30
1¼ "	1½ "	11	1 10	12	1 30	13	1 05	14	1 25				
1½ "	1½ "	15	1 38	16	1 63	17	1 30	18	1 55	19	1 40	20	1 65
1½ "	2 "	21	1 50	22	1 75	23	1 40	24	1 65				

PRICES OF EXTRAS.

Plungers, for Water Closets, complete	$2.50
Small Glasses	.10
Large Glasses	.15
Small Balls	.10
Large Balls	.15
Small Lead Cups	.30
Large Lead Cups	.40

Our customers will please be careful in ordering Traps, to give the NUMBER of the Trap, or else they must state the SIZE of the INLET and the OUTLET pipes, whether they wish the S, HALF S, or RUNNING TRAP, and the LEAD or GLASS bottoms.

CAST IRON SOIL AND SMOKE PIPE.



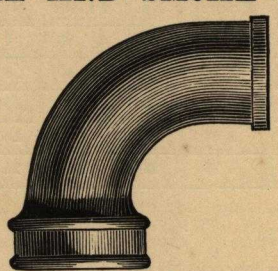
CAST IRON SOIL AND SMOKE PIPE, Single Hub.

Size, in inches	2	3	4	5	6	7	8
Price, per foot	$0.24	0.30	0.36	0.50	0.60	1 00	1 25

CAST IRON SOIL PIPE, Double Hub.

Size, in inches	2	3	4	5	6
Price, per foot, lengths of 5 feet	$1 50	1 80	2 10	2 80	3 30

CAST IRON SOIL AND SMOKE PIPE FITTINGS.



EIGHTH BENDS.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.35	0.45	0.60	0.90	1 05	2 00	2 75

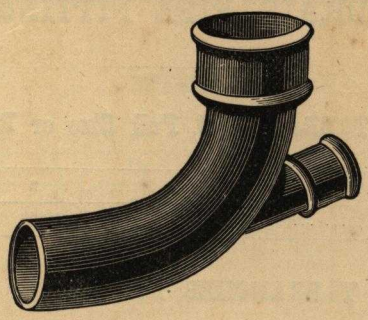
SIXTH BENDS.

Size, in inches	2	3	4	5	6
Price, each	$0.40	0.55	0.65	1 00	1 20

QUARTER BENDS.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.40	0.55	0.65	1 00	1 20	2 25	3 00

CAST IRON DRAIN PIPE FITTINGS.



QUARTER BENDS, With Two Inch Outlet for Connection.

Size, in inches	2	3	4	5	6
Price, each	$0.70	0.85	0.95	1 30	1 50

DOUBLE HUB QUARTER BENDS.

Size, in inches	2	3	4	5	6
Price, each	$ 0.70	0.85	0.95	1 30	1 50

LONG BENDS, 18 Inches in the Clear.

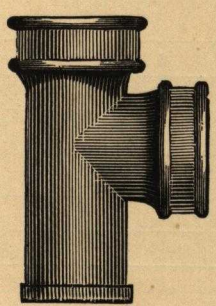
Size, in inches	4	5	6
Price, each	$1 50	2 25	2 50

RETURN BENDS.

Size, in inches	2	3	4	5	6
Price, each	$0.65	0.85	1 25	2 00	3 00

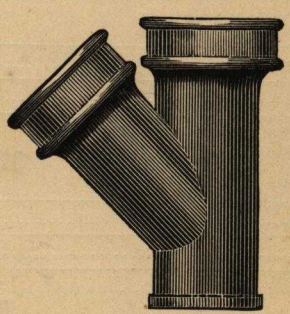
T BRANCHES,

FULL SIZE OR REDUCING.



Y BRANCHES,

FULL SIZE OR REDUCING.



T BRANCHES, Full Size or Reducing.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.40	0.55	0.65	1 20	1 40	2 75	3 25

Y BRANCHES, Full Size or Reducing.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.60	0.80	1 20	1 60	2 00	4 00	5 00

CAST IRON DRAIN PIPE FITTINGS—Continued.

HALF Y BRANCHES, Full Size or Reducing.

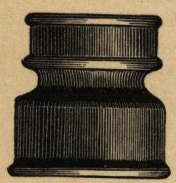
Size, in inches	2	3	4	5	6
Price, each	$0.60	0.80	1 20	1 60	2 00

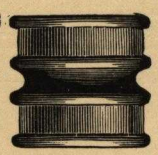
DOUBLE Y BRANCHES, Full Size or Reducing.

Size, in inches	2	3	4	5	6
Price, each	$1 00	1 25	1 65	2 25	3 00

CROSS HEAD BRANCHES, Full Size or Reducing.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.80	1 10	1 25	1 60	2 50	4 00	5 00





DOUBLE HUBS.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.30	0.45	0.65	0.75	0.80	1 40	1 50

SINGLE HUBS.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.25	0.35	0.40	0.60	0.75	1 25	1 40

STRAIGHT SLEEVES.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.30	0.45	0.65	0.75	0.80	1 40	1 50

REDUCING PIECES.

Size, in inches	4	5	6	7	8
Price, each	$0.50	0.70	0.80	1 30	1 60

PIPE STOPPERS.

Size, in inches	2	3	4	5	6
Price, each	$0.15	0.25	0.30	0.35	0.50

CAST IRON DRAIN PIPE FITTINGS—Continued.

OFFSETS.

2 inch to Offset 2 inch	$ 40	4 inch to Offset 12 inch	$1 40
2 inch to Offset 4 inch	50	4 inch to Offset 14 inch	1 65
2 inch to Offset 6 inch	60	4 inch to Offset 16 inch	1 80
2 inch to Offset 8 inch	70	4 inch to Offset 20 inch	2 25
2 inch to Offset 12 inch	85	5 inch to Offset 4 inch	1 40
3 inch to Offset 4 inch	75	5 inch to Offset 8 inch	1 80
3 inch to Offset 6 inch	80	5 inch to Offset 6 inch	1 60
3 inch to Offset 8 inch	90	5 inch to Offset 12 inch	2 00
3 inch to Offset 12 inch	1 00	5 inch to Offset 16 inch	2 40
4 inch to Offset 4 inch	85	6 inch to Offset 4 inch	2 00
4 inch to Offset 6 inch	1 00	6 inch to Offset 6 inch	2 25
4 inch to Offset 8 inch	1 15	6 inch to Offset 8 inch	2 40
4 inch to Offset 10 inch	1 25	6 inch to Offset 12 inch	2 75

OFFSETS, With Outlet.

4 inch to Offset 4 inch	$1 15	4 inch to Offset 12 inch	$1 70
4 inch to Offset 6 inch	1 30	4 inch to Offset 14 inch	1 95
4 inch to Offset 8 inch	1 45	4 inch to Offset 16 inch	2 10
4 inch to Offset 10 inch	1 55	4 inch to Offset 20 inch	2 55

THIMBLES, With Covers.

Size, in inches	4	5	6	8
Price, each	$0.60	0.70	0.90	2 25

THIMBLES.

Size, in inches	2	3	4	5	6
Price, each	$0.15	0.25	0.30	0.35	0.45

HOOKS FOR IRON SOIL PIPE.

Size, in inches	2	3	4	5	6	8
Price, each	$0.08	0.10	0.12	0.15	0.20	0.40

PIPE RESTS.

Size, in inches	2	3	4	5	6	7	8
Price, each	$0.30	0.40	0.50	0.60	0.70	1 00	1 10

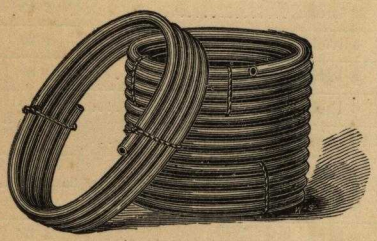
CAST IRON TRAPS,

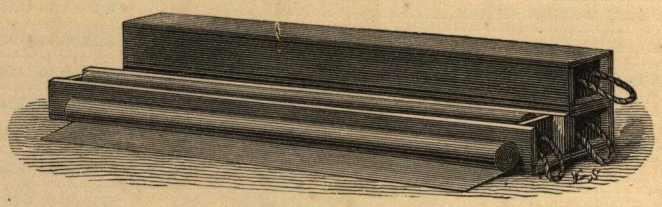
HALF S, THREE-QUARTER S, AND FULL S, AND RUNNING TRAPS.

Size, in inches	2	3	4	5	6
Price, each	$0.80	1 25	1 50	3 00	3 75
With Outlet in Heel or Side			2 00		
With Hub for Vent			2 00	3 50	4 25
With Hubs for Double Vent			2 50	4 00	4 75

LIST OF LEAD PIPE, SHEET AND BAR LEAD,

LIST OF CALIBER AND WEIGHTS OF LEAD PIPE





CALIBER.	WEIGHT PER FOOT.	
	LBS.	OZ.
¼ inch Tubing	0	6
⅜ inch Aquaduct	0	8
light	0	12
medium	1	0
strong	1	8
ex. strong	2	0
½ inch Aquaduct	0	10
ex. light	0	12
light	1	0
medium	1	4
strong	1	12
ex. strong	2	8
⅝ inch Aquaduct	0	12
ex. light	1	4
light	1	12
medium	2	0
strong	2	8
ex. strong	3	0
¾ inch Aquaduct	1	0
ex. light	1	8
light	2	0
medium	2	4
strong	3	0
ex. strong	3	8
⅞ inch Aquaduct	1	8
ex. light	2	0
light	2	8
1 inch Aquaduct	1	8
ex. light	2	0
light	2	8
medium	3	4
strong	4	0
ex. strong	4	12
1¼ inch Aquaduct	2	0
ex. light	2	8
light	3	0
medium	3	12
strong	4	12
ex. strong	6	0

CALIBER.	WEIGHT PER FOOT.	
	LBS.	OZ.
1½ inch Aquaduct	3	0
ex. light	3	8
light	4	0
medium	5	0
strong	6	0
ex. strong	7	8
1¾ inch ex. light	3	12
light	4	8
medium	5	8
strong	6	8
ex. strong	8	0
2 inch waste	3	0
2 inch ex. light	4	0
light	5	0
medium	7	0
strong	8	0
ex. strong	9	0
2½ inch 3-16 thick	8	0
¼ thick	11	0
5-16 thick	14	0
⅜ thick	17	0
3 inch waste	5	0
3-16 thick	9	0
¼ thick	12	0
5-16 thick	16	0
⅜ thick	20	0
3½ inch ¼ thick	15	0
5-16 thick	18	0
⅜ thick	21	0
4 inch waste	5	0
¼ thick	16	0
5-16 thick	21	0
⅜ thick	25	0
7-16 thick	30	0
4½ inch waste	6	0
5 inch waste	8	0

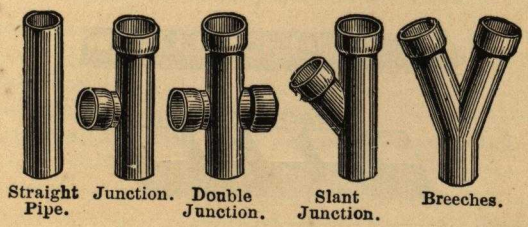
Aquaduct Pipe is put on reels. Other sizes in coils of about 150 lbs. each. Waste Pipe, and all pipe over two inches diameter, is made in lengths of 10 to 15 feet. Sheet Lead, of all weights, from 2½ lbs. per square foot upward.

WEIGHTS AND SIZES OF SHEET LEAD.

Pounds sq. ft.	2½	3	3½	4	4½	5	6	7	8	9	10	11	12
Wire Gauge No.	19	18	17	16	15	14	13	12	11	10	9	8	7

SOCKET SEWER PIPE,

THREE TO THIRTY INCHES IN DIAMETER.



Straight Pipe. Junction. Double Junction. Slant Junction. Breeches.

Elbow. Stench Trap. Curve.

SOCKET SEWER PIPE,

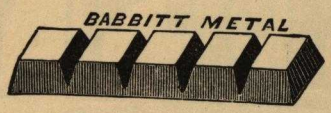
THREE TO THIRTY INCHES IN DIAMETER.

PRICE LIST.

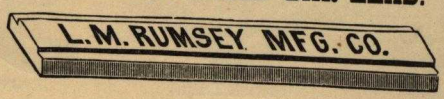
Inside Diameter.	Straight Pipe. Per Foot.	Curves and Elbows. Each.	Junctions. Each.	Stench Traps. Each.	Double Junctions and Breeches.	Increasers, Decreasers and Slants.	Weight. Per foot.	Area in Inches.
3 inch.....	$ 0 15	$ 0 50	$ 0 60	$ 1 70	$ 0 90	$ 0 45	5 lbs.	7
4 inch.....	0 20	0 60	0 80	2 10	1 20	0 60	9 lbs.	12
6 inch.....	0 30	1 00	1 20	2 90	1 80	0 90	15 lbs.	28
8 inch.....	0 40	1 50	1 60	4 00	2 40	1 20	20 lbs.	50
9 inch.....	0 50	1 75	2 00	5 00	3 00	1 50	25 lbs.	64
10 inch.....	0 60	2 10	2 40	6 00	3 60	1 80	30 lbs.	78
12 inch.....	0 75	2 75	3 00	8 50	4 50	2 25	35 lbs.	113
15 inch.....	1 00	3 75	4 00			3 00	50 lbs.	177
18 inch.....	1 50	4 75	6 00			4 50	65 lbs.	254
24 inch.....	2 50	8 00	10 00				100 lbs.	452
30 inch.....	4 00	12 00	16 00				125 lbs.	706

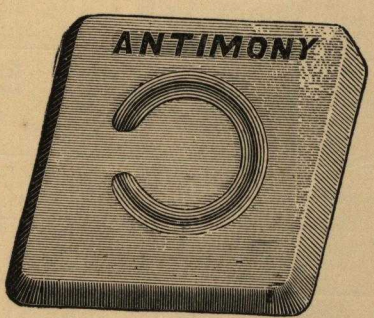
☞ 24 and 30-inch Pipe not governed by the usual discounts. Price for 1-foot pieces, with Sockets, same as for two feet of Straight Pipe.

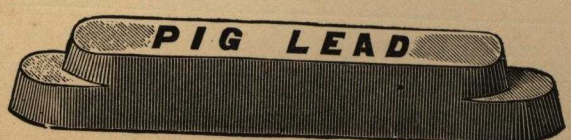
METALS.



MACHINE PRESSED BAR LEAD.







PRICES OF MANUFACTURED COPPER.

SUBJECT TO MARKET CHANGES.

Braziers' ordinary sizes, 16 ounces per square foot and over, per pound.....

Locomotive Fire Box Sheets, per pound.....

Braziers' ordinary sizes, under 16 ounces and over 12 ounces per square foot, per pound.....

All Sheets 10 and 12 ounces per square foot, per pound.....

All Sheets under 10 ounces per square foot, per pound.....

Circles less than 84 inches diameter, per pound.....

Circles 84 inches diameter and over, per pound.....

Segment and Irregular Pattern Sheets, per pound.....

Sheathing (Sheets 14x48) 14 to 34 ounces, per pound.....

Bolt Copper, per pound.....

Sheathing Copper, tinned on one side, extra, per sheet.....

Tinnning Sheets other than Sheathing, per square foot.....

For tinning both sides, double the above amount.

Solder, Tinners' No. 1, per pound.....

Solder, Tinners' Half and Half, per pound.....

Solder, Plumbers', per pound.....

Babbitt Metal, Genuine, per pound.....

Babbitt Metal, No. 1, per pound.....

Babbitt Metal, No. 2, per pound.....

Babbitt Metal, No. 3, per pound.....

Babbitt Metal, No. 4, per pound.....

Ingot Copper, per pound.....

Block Tin, per pound.....

Antimony, per pound.....

Spelter, per pound.....

Pig Lead, per pound.....

Bar Lead, Machine Pressed, per pound.....

LOWEST MARKET RATES.

PLUMBERS' TOOLS.

CHIPPING KNIVES.

CHIPPING KNIVES.

Size	4	5	6 in.
Each	40	50	60

SHAVE HOOKS.

SHAVE HOOKS.

Per doz	$4 00

COPPER BOLTS, Hatchet.

COPPER BOLTS, Hatchet.

Per pound	50

COPPER BOLTS, Pointed.

COPPER BOLTS, Pointed.

Per pound	50

ROUND IRONS.

ROUND IRONS.

Numbers	1	2	3
Each	$1 00	1 25	1 50

LADLES.

LADLES.

Size	2½	3	3½	4	5	6 in.
Per doz	$3 75	4 65	5 50	6 50	8 75	10 50

RASPS AND FILES.

RASPS AND FILES.

Size	10	11	12	13	14 in.
Per doz	$4 80	6 00	7 20	8 40	9 60

CHISELS.

CHISELS.

Price Small, each	30
Price Large, each	45

GOUGES.

GOUGES.

Price Small, each	35
Price Large, each	50

SCREW DRIVERS.

SCREW DRIVERS.

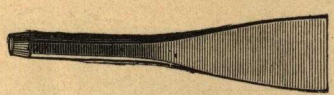
Price, each	50

COLD CHISELS.

COLD CHISELS.

Size	Short.	18	22 in.
Price, each	35	75	$1 80

FLOOR CHISELS.



FLOOR CHISELS.

Price, each	$1 00

CALKING CHISELS.

CALKING CHISELS.

Price, each	50

BENDING PINS,

CURVED OR STRAIGHT.

BENDING PINS,

CURVED AND STRAIGHT.

Per doz	$3 00

BOSSING STICKS.

BOSSING STICKS.

Boxwood, per doz	$12 00

DRESSERS.

DRESSERS.

Hickory	$ 50
Boxwood	1 00

TURN PINS.

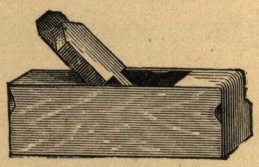
TURN PINS.

Number	1	2	3
Per doz	$2 75	3 00	4 00

SIDE EDGE.

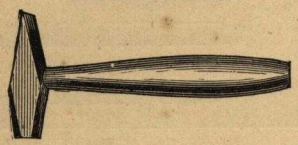
Price, per doz	$ 8 00

PLANE.



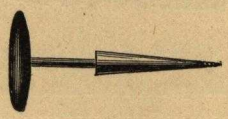
Price, each	$ 2 00

HAMMER.



Price, each	$ 1 00

TAP BORER.

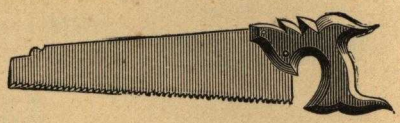


Price, per doz	$ 6 00

COMPASS SAW.

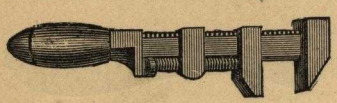
Price, each	$ 0 75

PLUMBERS' SAW.



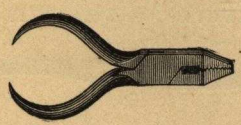
Size	12	14	16	18 in.
Price, per doz	$ 9 00	9 50	10 00	10 50

WRENCH.



Size	10	12	15 in.
Price, each	$ 1 00	1 25	2 00

CUTTING PLYERS.

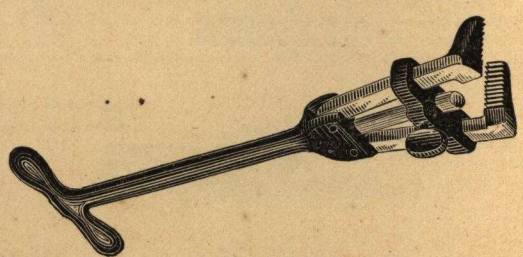


Numbers	1	2
Price, each	$ 0 50	1 00

GAS PLYERS.

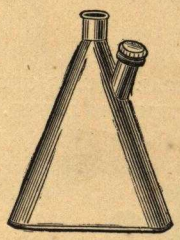
Size	6	7	8	9	10	11	12	13 in.
Black	$0 90	1 10	1 30	1 60	1 90	2 10	2 90	3 15
Polished	1 15	1 30	1 50	1 80	2 10	2 30	3 10	3 35

BUZZEEL BASIN WRENCH.



Price, each	$ 1 25

TORCH.



Price, each	$1 50

BLOW PIPE.

Price, each	$1 25

TOOL BAG.

Price, each	$4 50
Price Leather Bottom, each	5 00

GREASE BOX.

Price, each	$2 50

SOIL BOX.

Price, each	$ 0 75

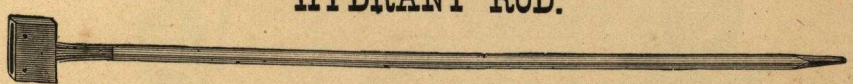
STREET WASHER KEY.

Price, per doz	$ 2 00

STREET WASHER ROD.

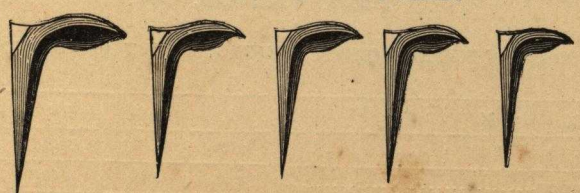
Price, per doz	$5 00

HYDRANT ROD.



Price, per doz	$6 00

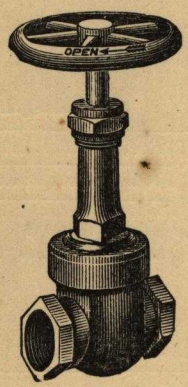
PLUMBERS' HOOKS.



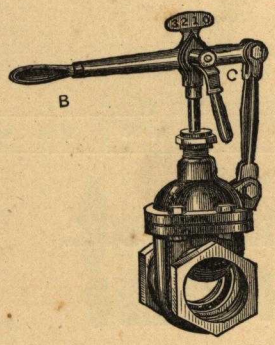
Plumbers' Hooks, per pound	$0 25

LUDLOW VALVES,

BEST COMPOSITION METAL. DOUBLE GATE SCREWED END.



BEST COMPOSITION METAL. QUICK OPENING VALVE, SLIDE, STEM AND LEVER.

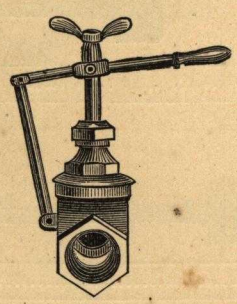


LUDLOW VALVES.

Size	½	¾	1	1¼	1½	2	2½	3 in.
Price	$1 25	1 65	2 15	3 15	4 25	6 25	11 50	16 00
Ex. for Slide, Stem and Lever, Quick Open'g	1 00	1 00	1 00	1 00	1 00	1 00	1 25	1 25

PEET VALVES,

BEST COMPOSITION METAL. QUICK OPENING, WITH T AND LEVER HANDLE.



PEET VALVES.

BEST COMPOSITION METAL. QUICK OPENING, WITH T AND LEVER HANDLE.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Screwed End	$1 00	1 00	1 20	1 75	2 50	3 50	5 00	7 50	15 00	22 00
With T Handle, Quick Opening					3 00	4 00	6 00	9 00	18 00	24 00
With Lever Handle, Quick Opening					4 00	5 00	7 00	10 00	19 00	25 00

LUDLOW VALVES.

IRON VALVES, Single Gate,

BRASS MOUNTED WITH GOOD STEAM METAL—NOT YELLOW BRASS.

List No. 1.

Size, inches	2½	3	3½	4	5	6	7	8	10	12
Screwed Ends	$ 9 30	11 50	15 25	16 75	24 00	29 00	36 00	41 50		
Flanged Ends	9 50	12 00	15 75	17 25	23 50	28 50	35 00	40 00	53 00	67 00
Hub Ends	9 50	13 00	15 00	16 00	23 00	27 00	34 00	39 00	52 00	65 00
Ex. for Slide Stem and Lever, Quick Open'g	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25		

SINGLE GATE VALVES, All Iron.

List No. 1.

Size, inches	2½	3	3½	4	5	6	7	8	10	12
Screwed Ends	$ 8 75	10 00	13 50	14 00	21 50	25 00	33 50	36 00		
Flanged Ends	9 00	10 50	14 00	14 50	21 00	24 50	32 50	34 50	47 00	62 00
Hub Ends	8 25	9 75	13 00	13 50	20 50	24 00	31 50	33 50	46 00	60 00

DOUBLE GATE IRON VALVES,

TO BEAR HEAVY PRESSURE EITHER SIDE. BRASS MOUNTED WITH GOOD STEAM METAL.

List No. 4.

Size, inches.	2½	3	3½	4	5	6	7	8	10	12
Screwed Ends	$10 50	13 00	16 50	18 00	25 00	31 50	38 00	45 00		
Flanged Ends	10 75	13 50	17 00	18 50	24 50	30 50	37 00	43 50	60 00	78 00
Hub Ends	10 75	14 50	16 00	17 50	24 00	29 00	36 00	42 00	58 00	76 00

DOUBLE GATE VALVES, All Iron.

List No. 4.

Size, inches	2½	3	3½	4	5	6	7	8	10	12
Screwed Ends	$ 9 25	10 75	14 25	15 50	23 00	26 00		37 50		
Flanged Ends	9 50	11 25	14 75	16 00	22 50	25 50	34 00	36 00	49 00	64 00
Hub Ends	8 75	10 25	13 75	15 00	22 00	25 00	33 00	35 00	48 00	62 00

DOUBLE GATE IRON VALVES,

TO BEAR EXTRA HEAVY PRESSURE EITHER SIDE. BRASS MOUNTED WITH GOOD STEAM METAL.

List No. 5.

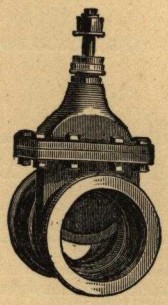
Size, inches	3	3½	4	5	6	7	8	10	12
Screwed Ends	$15 00	16 50	19 50	25 00	33 00	38 00	48 00		
Flanged Ends	15 50	17 00	20 00	24 50	32 50	37 00	47 00	66 00	88 00
Hub Ends	14 50	16 00	19 00	24 00	31 50	36 00	45 00	63 00	83 00

Screwed Socket and Flange, up to 6 inch inclusive, have Brass Nuts and Glands to Packing Boxes.

IRON BODY PEET VALVES,

BRASS MOUNTED, BEST STEAM METAL.
FLANGED VALVE.

BRASS MOUNTED, BEST STEAM METAL.
HUB END WATER GATE.



IRON BODY PEET VALVES.

Size, inches	2½	3	3½	4	5	6	7	8	10	12
Diameter of Flanges, inches	7	7	8	9	10	11	13	14	16	18
Distance from Face to Face, inches	7¾	8	8¾	9½	10½	12	13	14	15	16
Price, Flanged or Screw Ends, inches	$12 00	15 00	18 00	20 00	25 00	30 00	40 00	50 00	65 00	90 00

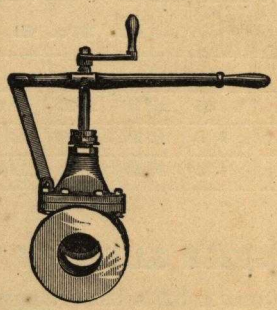
IRON BODY WATER GATES,

HUB END. BRASS MOUNTED.

Size, inches	3	4	6	8	10	12
Price	$15 00	20 00	30 00	50 00	65 00	90 00

QUICK OPENING PEET VALVES,

IRON BODY, BRASS MOUNTED—FLANGE OR SCREW ENDS.



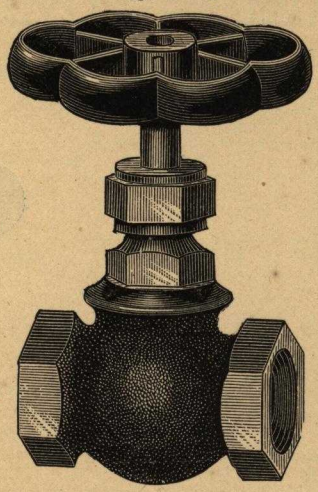
QUICK OPENING PEET VALVES,

IRON BODY, BRASS MOUNTED—FLANGE OR SCREW ENDS.

Size, inches	2½	3	3½	4	5	6	7	8	10
With Lever	$16 00	20 00	22 00	25 00	30 00	35 00	45 00	55 00	70 00

GLOBE VALVES, Steam Metal.

Fig. 656.



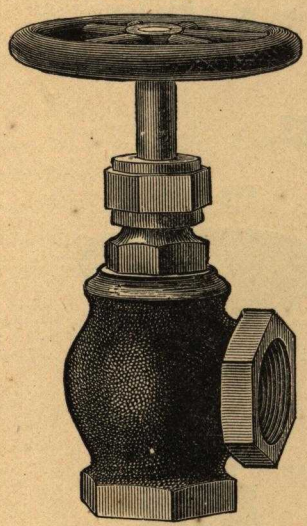
GLOBE VALVES, Steam Metal, Screwed, Fancy Wheel.

Fig. 656.

Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3 in.
Each	$0 60	0 60	0 75	0 95	1 30	1 70	2 60	3 60	5 60	11 25	16 00

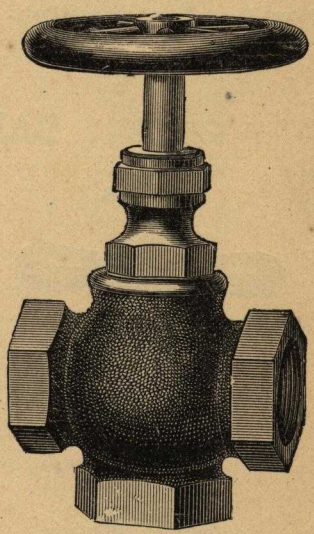
ANGLE VALVES, St'm Metal, Screwed.

Fig. 673.



CROSS VALVES, St'm Metal.

Fig. 689.



ANGLE VALVES, Steam Metal, Screwed, with Common or Fancy Wheel.

Fig. 673.

Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3 in.
Each	$0 60	0 60	0 75	0 95	1 30	1 70	2 60	3 60	5 60	11 25	16 00

CROSS VALVES, Steam Metal, Screwed.

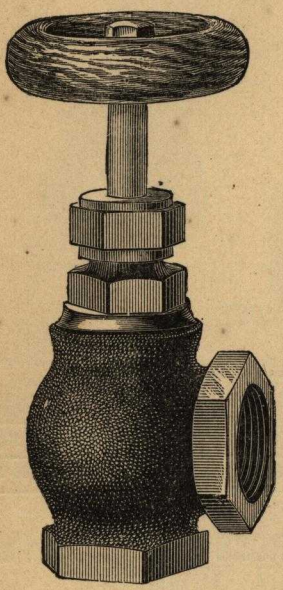
Fig. 689.

Size	⅜	½	¾	1	1¼	1½	2	2½	3 in.
Each	$1 00	1 50	2 00	2 50	3 50	5 00	8 00	16 00	24 00

RADIATOR VALVES,

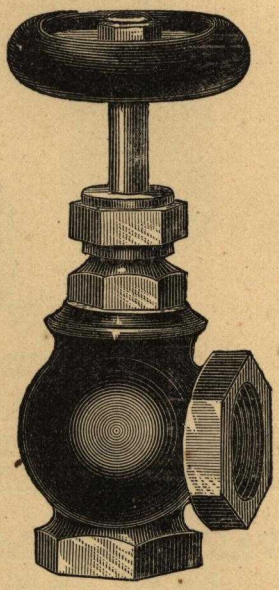
STEAM METAL, WITH OR WITHOUT FRINK'S PATENT SEAT.

Fig. 681.



Patent Wood Wheel, Rough Body.

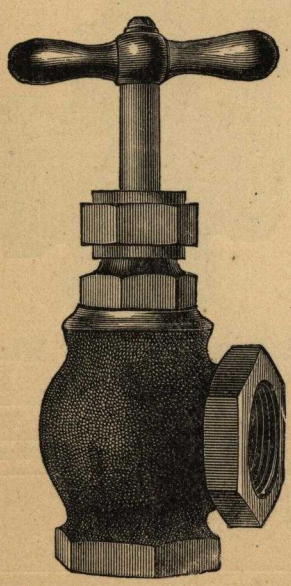
Fig. 682.



Patent Wood Wheel, Finished.

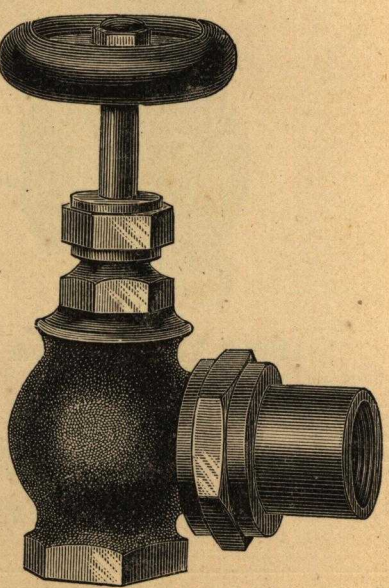
RADIATOR VALVES.

Fig. 683.



T Handle, Rough or Finished.

Fig. 686.



Patent Wood Wheel, with Union.

RADIATOR VALVES,

ROUGH, PATENT WOOD WHEEL.

Fig. 681.

Size	⅜	½	¾	1	1¼	1½	2
Rough Body, Brass Seat, each	$1 00	1 25	1 60	2 00	3 25	4 50	6 50
Rough Body, Brass Seat, Nickel-Plated Trimmings	1 20	1 45	1 85	2 25	3 50	4 80	6 80
Rough Body, Brass Seat, Nickel-Plated, each	1 30	1 55	1 95	2 40	3 70	5 00	7 25
Rough Body, Frink Seat, each	1 20	1 45	1 80	2 25	3 65	5 10	7 50
Rough Body, Frink Seat, Nickel-Plated, each	1 50	1 75	2 15	2 65	4 10	5 60	8 25

RADIATOR VALVES,

FINISHED, PATENT WOOD WHEEL.

Fig. 682.

Size	⅜	½	¾	1	1¼	1½	2
Finished Body, Brass Seat, each	$1 50	1 75	2 15	2 60	4 00	5 50	7 75
Finished Body, Brass Seat, Nickel-Plated, each	1 80	2 05	2 50	3 20	4 45	6 00	8 50
Finished Body, Frink Seat, each	1 70	1 95	2 35	3 05	4 40	6 10	8 75
Finished Body, Frink Seat, Nickel-Plated, each	2 00	2 25	2 70	3 45	4 85	6 60	9 50

RADIATOR VALVES,

FINISHED, T HANDLE.

Fig. 683.

Size	⅜	½	¾	1	1¼	1½	2
Rough Body, Brass Seat, each	$1 00	1 25	1 60	2 00	3 25	4 50	6 50
Rough Body, Brass Seat, Nickel-Plated, each	1 30	1 55	1 85	2 40	3 70	5 00	7 25
Rough Body, Frink Seat, each	1 20	1 45	1 80	2 25	3 65	5 10	7 50
Rough Body, Frink Seat, Nickel-Plated, each	1 50	1 75	2 15	2 65	4 10	5 60	8 25
Finished Body, Brass Seat, each	1 50	1 75	2 15	2 60	4 00	5 50	7 75
Finished Body, Brass Seat, Nickel-Plated, each	1 80	2 05	2 50	3 20	4 45	6 00	8 50
Finished Body, Frink Seat, each	1 70	1 95	2 35	3 05	4 40	6 10	8 75
Finished Body, Frink Seat, Nickel-Plated, each	2 00	2 25	2 70	3 45	4 85	6 60	9 50

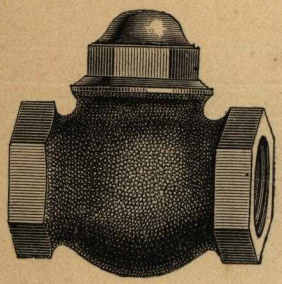
RADIATOR VALVES,

PATENT WOOD WHEEL, WITH UNION.

Fig. 686.

Size	⅜	½	¾	1	1¼	1½	2
Rough Body, Brass Seat, each	$1 50	1 75	2 20	2 80	4 25	6 00	9 00
Rough Body, Brass Seat, Nickel-Plated, each	1 80	2 05	2 55	3 20	4 70	6 50	9 75
Rough Body, Frink Seat, each	2 00	2 25	2 75	3 40	5 00	7 00	10 25
Rough Body, Frink Seat, Nickel-Plated, each	2 30	2 55	3 10	4 00	5 45	7 50	11 00
Finished Body, Brass Seat, each	1 70	1 95	2 40	3 05	4 65	6 60	10 00
Finished Body, Brass Seat, Nickel-Plated, each	2 00	2 25	2 75	3 45	5 10	7 10	10 75
Finished Body, Frink Seat, each	2 20	2 45	2 95	3 85	5 40	7 60	11 25
Finished Body, Frink Seat, Nickel-Plated, each	2 50	2 75	3 30	4 25	5 85	8 10	12 00

Fig. 699.



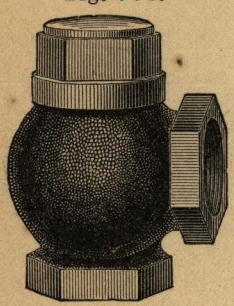
HORIZONTAL CHECK VALVES,

STEAM METAL—SCREWED.

Fig. 699.

Size, inches.....	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Each.....	$0 50	0 50	0 55	0 80	1 10	1 40	2 25	3 10	4 90	10 00	14 00

Fig. 706.



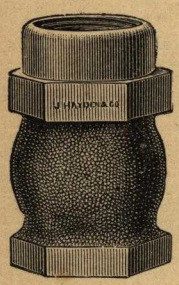
ANGLE CHECK VALVES,

STEAM METAL—SCREWED.

Fig. 706.

Size, inches.....	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Each.....	$0 50	0 50	0 55	0 80	1 10	1 40	2 25	3 10	4 90	10 00	14 00

Fig. 703.



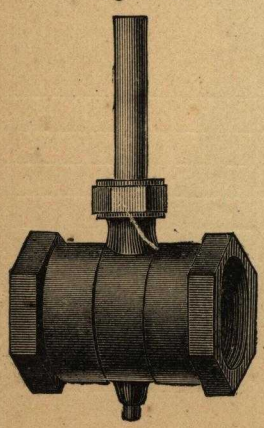
PERPENDICULAR CHECK VALVES,

STEAM METAL—SCREWED.

Fig. 703.

Size, inches.....	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Each.....	$0 50	0 50	0 55	0 80	1 10	1 40	2 25	3 10	4 90	10 00	14 00

Fig. 695.



BUTTERFLY VALVES,

STEAM METAL—SCREWED.

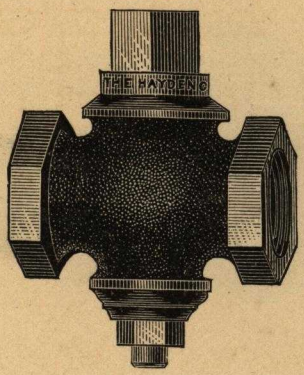
Fig. 695.

Size, inches.....	1	1¼	1½	2	2½	3
Each.....	$3 50	4 50	5 50	8 00	11 00	16 00

STEAM COCKS,

STEAM METAL—SQUARE HEAD.

Fig. 739.



STEAM COCKS, Steam Metal, Square Head.

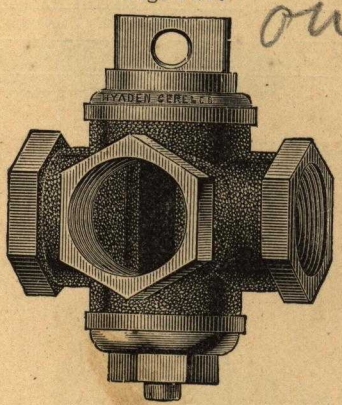
Fig. 739.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Extra Heavy	$ 0 63	0 75	1 05	1 45	2 00	3 20	4 40	6 50	13 75	20 00		

THREE-WAY STEAM COCKS,

STEAM METAL—SCREWED.

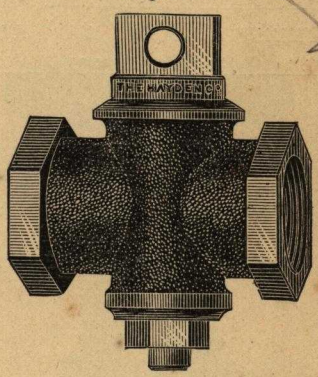
Fig. 747.



SERVICE COCKS,

FLAT HEAD.

Fig. 750.



THREE-WAY STEAM COCKS, Steam Metal, Screwed.

Fig. 747.

Size	½	¾	1	1¼	1½	2	2½	3
Each	$ 1 50	2 00	3 00	4 50	6 00	9 00	17 00	24 00

SERVICE COCKS, Flat Head.

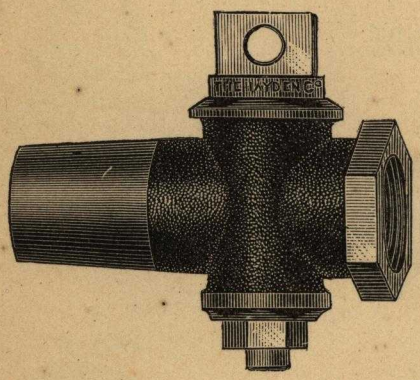
Fig. 750.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Extra, each	$ 0 60	0 70	0 80	1 15	1 50	2 20	3 20	5 00	10 00	16 00	28 00	40 00
Each, No. 2	0 50	0 60	0 70	0 95	1 20	1 80	2 60	4 25	8 50	14 00		

METER COCKS,

FLAT HEAD.

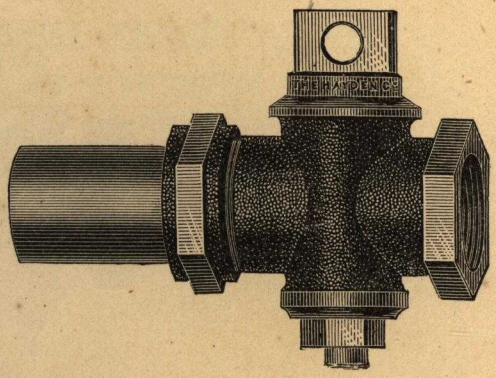
Fig. 753.



UNION METER COCKS,

FLAT HEAD.

Fig. 755.



METER COCKS, Flat Head.

Fig. 753.

Size, inches	½	¾	1	1¼	1½	2	2½	3
Extra, each	$0 90	1 35	1 80	2 60	3 80	5 75	11 50	18 00
No. 2, each	0 80	1 15	1 50	2 20	3 20	5 00	10 00	16 00

Square Head, same price.

UNION METER COCKS, Flat Head.

Fig. 755.

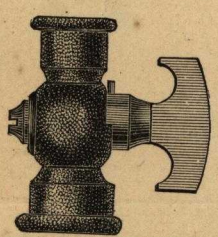
Size, inches	½	¾	1	1¼	1½	2
Extra, each	$1 10	1 45	2 10	3 10	4 50	6 75
No. 2, each	1 00	1 25	1 85	2 80	4 00	6 00

Square Head, same price.

LAMP POST COCKS.

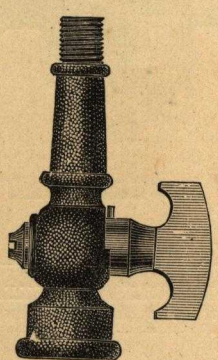
SHORT PATTERN.

Fig. 768.



LONG PATTERN.

Fig. 765.



LAMP POST COCKS.

SHORT PATTERN.

Fig. 768.

Size, inches	⅛ x ¼	⅛ x ⅜	⅛ x ½	⅛ x ¾ in.
Rough, per doz	$6 00	7 20	8 40	9 60

LONG PATTERN.

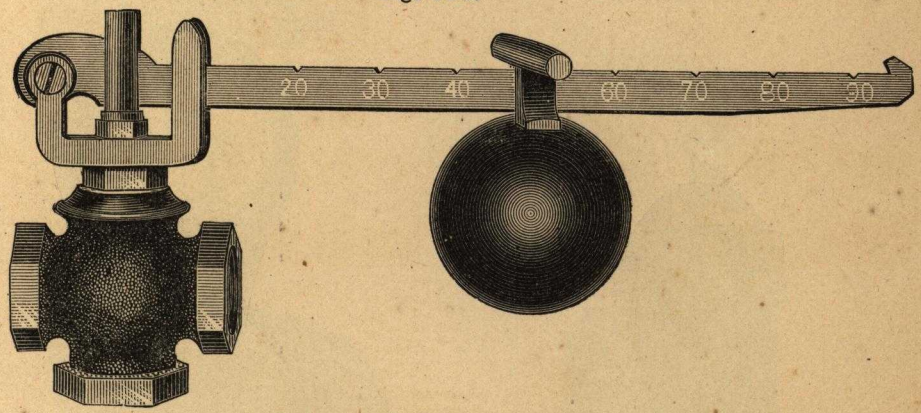
Fig. 765.

Size, inches	⅛ x ½	⅛ x ¾
Rough, per doz	$12 00	13 50

GLOBE SAFETY VALVES,

STEAM METAL, SCREWED.

Fig. 711.



GLOBE SAFETY VALVES, Steam Metal, Screwed.

Fig. 711.

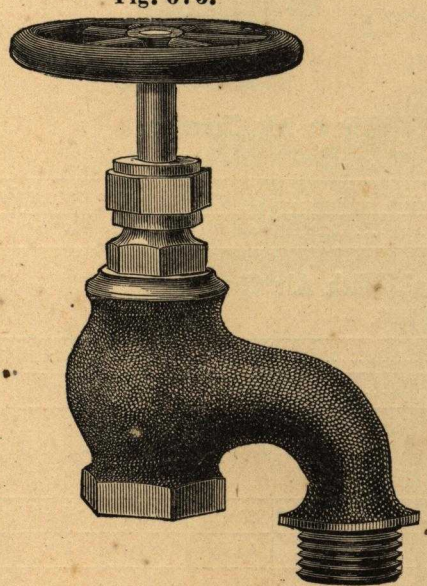
Size	¼	⅜	½	¾	1	1¼	1½	2 in.
Each	$1 60	1 80	2 25	2 80	3 80	5 50	7 00	11 00

Angle Safety Valves, same price.

HOSE ANGLE VALVES,

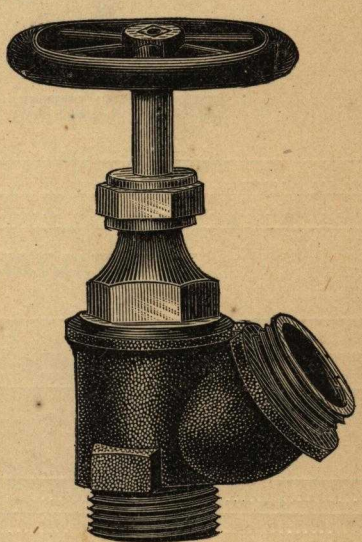
STEAM METAL, SCREWED.

Fig. 675.



STEAM METAL, SCREWED, CHICAGO PATTERN.

Fig. 676.



HOSE ANGLE VALVES,

STEAM METAL, SCREWED.

Fig. 675.

Size	½	¾	1	1¼	1½	2	2½ in.
Each	$1 00	1 50	2 60	3 50	5 00	8 00	14 00

STEAM METAL, SCREWED, CHICAGO PATTERN.

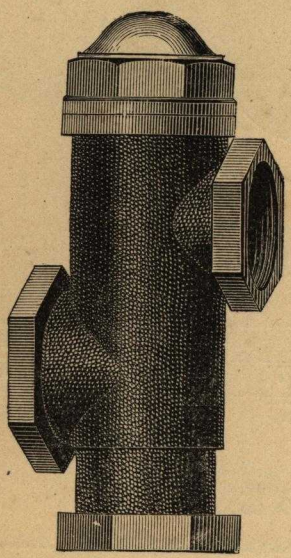
Fig. 676.

Size	1¼	2	2½ in.
Each	$ 6 00	8 00	10 00

PUMP VALVES.

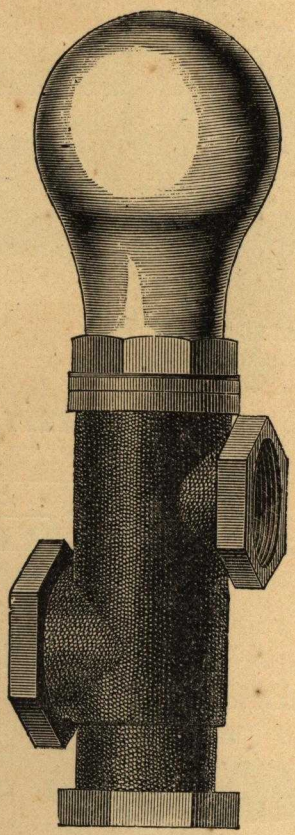
STEAM METAL, WITHOUT AIR CHAMBER.

No. 1, Fig. 725.



STEAM METAL, WITH AIR CHAMBER.

No. 2, Fig. 726.



PUMP VALVES, Steam Metal, Without Air Chamber.

No. 1, Fig. 725.

Size	¾ x ½	1 x ¾	1¼ x 1	1½ x 1¼
Each	$2 00	3 00	4 00	6 00

PUMP VALVES, Steam Metal, With Air Chamber.

No. 2, Fig. 726.

Size	¾ x ½	1 x ¾	1¼ x 1	1½ x 1¼
Each	$2 25	3 50	5 00	7 50

PUMP VALVES, Steam Metal, With Air Chamber, Side Outlet.

No. 3, Fig. 727.

Size	¾ x ½	1 x ¾	1¼ x 1	1¼ x 1½
Each	$2 25	3 50	5 00	7 50

PUMP VALVES,

STEAM METAL, WITH AIR CHAMBER AND AIR COCK.

No. 4, Fig. 728.

Size	¾ x ½	1 x ¾	1¼ x 1	1½ x 1¼
Each	$2 75	4 00	5 50	8 00

STEAM METAL, WITH AIR CHAMBER, AUTOMATIC RELIEF AND AIR COCK.

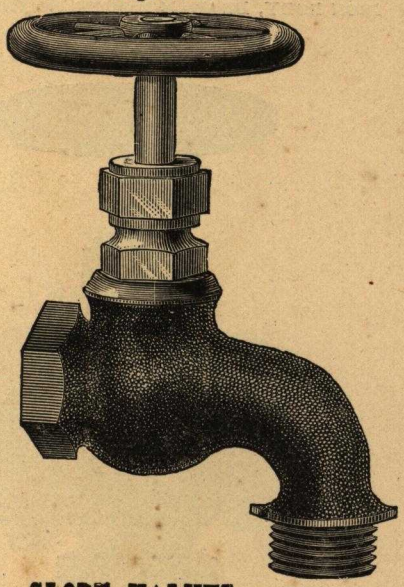
No. 5, Fig. 729.

Size	¾ x ½	1 x ¾	1¼ x 1	1½ x 1¼
Each	$6 00	7 00	8 50	12 00

GLOBE VALVES,

STEAM METAL, FOR HOSE, IRON PIPE.

Fig. 665.



VACUUM VALVES,

STEAM METAL.

Fig. 723.

GLOBE VALVES,

STEAM METAL, FOR HOSE, IRON PIPE.

Fig. 665.

Size	½	¾	1	1¼	1½	2	2½
Each	$1 00	1 50	2 60	3 50	5 00	8 00	14 00

VACUUM VALVES,

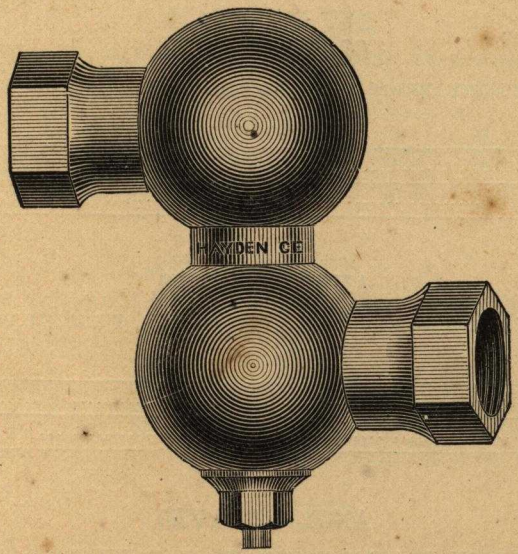
STEAM METAL.

Fig. 723.

Size	¼	⅜	½	¾
Each	$0 75	1 00	1 25	1 75

SWING JOINTS, For Steam Pipe.

Fig. 736.



FINISHED SWING JOINTS, Steam Metal.

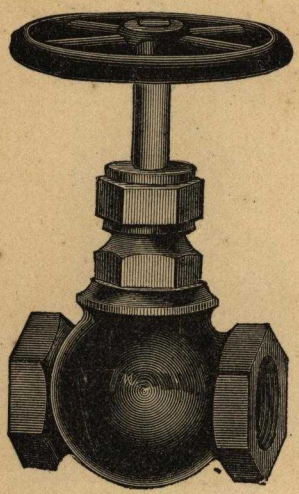
Fig. 736.

Size	⅜	½	¾	1	1¼	1½	2
Each	$1 25	1 75	2 50	4 00	5 00	7 00	12 00

GLOBE VALVES,

IRON BODY, BRASS MOUNTED, WITHOUT YOKE.

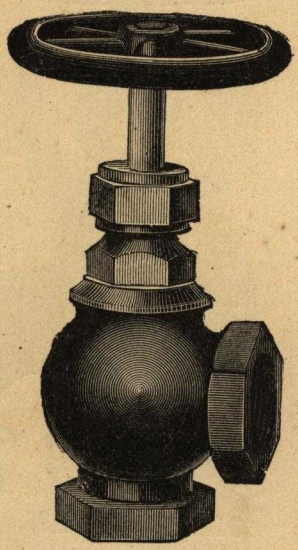
Fig. 669.



ANGLE VALVES,

IRON BODY, BRASS MOUNTED, WITHOUT YOKE.

Fig. 677.



GLOBE VALVES,

IRON BODY, BRASS MOUNTED, SCREWED, WITHOUT YOKE.

Fig. 669.

Size, inches	2	2½	3
Each	$4 50	7 50	10 50

GLOBE VALVES,

IRON BODY, BRASS MOUNTED, FLANGED, WITHOUT YOKE.

Fig. 670.

Size, inches	2	2½	3
Each	$5 75	9 00	12 50

ANGLE VALVES,

IRON BODY, BRASS MOUNTED, SCREWED, WITHOUT YOKE.

Fig. 677.

Size, inches	2	2½	3
Each	$4 50	7 50	10 50

ANGLE VALVES,

IRON BODY, BRASS MOUNTED, FLANGED, WITHOUT YOKE.

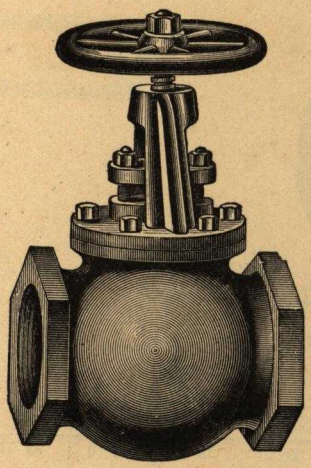
Fig. 679.

Size, inches	2	2½	3
Each	$5 75	9 00	12 50

GLOBE VALVES,

IRON BODY, BRASS MOUNTED, WITH YOKE.

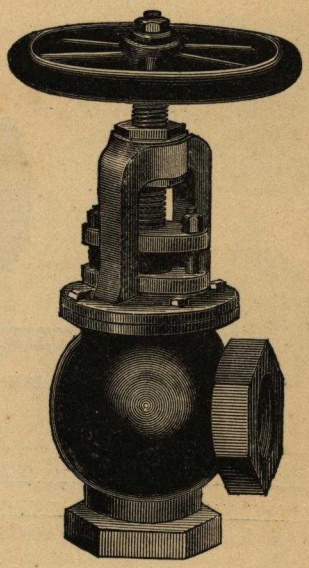
Fig. 671.



ANGLE VALVES,

IRON BODY, BRASS MOUNTED, WITH YOKE.

Fig. 678.



GLOBE VALVES,

IRON BODY, BRASS MOUNTED, SCREWED, WITH YOKE.

Fig. 671.

Size	2	2½	3	3½	4	5	6	8	10
With Brass Spindle, each	$7 50	10 00	14 50	16 00	20 00	32 00	44 00	75 00	120 00
With Iron Spindle, each	6 75	9 00	13 75	14 50	18 00	29 00	38 00	68 00	110 00

GLOBE VALVES,

IRON BODY, BRASS MOUNTED, FLANGED, WITH YOKE.

Fig. 672.

Size	2	2½	3	3½	4	5	6	8	10	12
With Brass Spindle	$8 75	11 50	16 50	18 50	23 00	36 00	49 00	81 00	130 00	220 00
With Iron Spindle, ea.	8 00	10 50	15 75	17 00	21 00	33 00	43 00	74 00	120 00	205 00

ANGLE VALVES,

IRON BODY, BRASS MOUNTED, SCREWED, WITH YOKE.

Fig. 678.

Size	2	2½	3	3½	4	5	6	8	10
With Brass Spindle, each	$7 50	10 00	14 50	16 00	20 00	32 00	44 00	75 00	120 00
With Iron Spindle, each	6 75	9 00	13 75	14 50	18 00	29 00	38 00	68 00	110 00

ANGLE VALVES,

IRON BODY, FLANGED, BRASS MOUNTED, WITH YOKE.

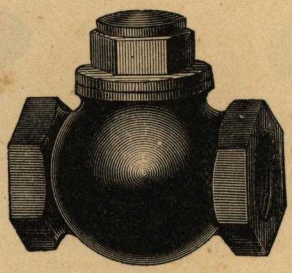
Fig. 680.

Size	2	2½	3	3½	4	5	6	8	10	12
With Brass Spindle	$8 75	11 50	16 50	18 50	23 00	36 00	49 00	81 00	130 00	220 00
With Iron Spindle, ea.	8 00	10 50	15 75	17 00	21 00	33 00	43 00	74 00	120 00	205 00

HORIZONTAL CHECK VALVES,

IRON BODY, BRASS MOUNTED.

Fig. 701.



HORIZONTAL CHECK VALVES,

IRON BODY, BRASS MOUNTED—SCREWED.

Fig. 701.

Size	2½	3	3½	4	5	6	8 in.
Each	$ 6 25	8 75	11 50	15 00	24 00	33 00	65 00

HORIZONTAL CHECK VALVES,

IRON BODY, BRASS MOUNTED—FLANGED.

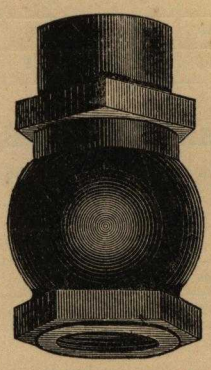
Fig. 702.

Size	2½	3	3½	4	5	6	8	10	12 in.
Each	$7 75	10 75	14 00	18 00	28 00	38 00	71 00	100 00	190 00

PERPENDICULAR CHECK VALVES,

IRON BODY, BRASS MOUNTED—SCREWED.

Fig. 707.



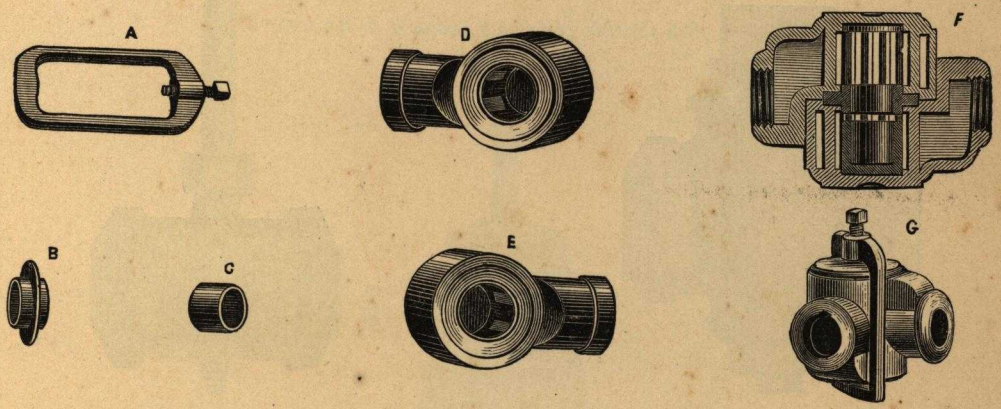
PERPENDICULAR CHECK VALVES,

IRON BODY, BRASS MOUNTED—SCREWED

Fig. 707.

Size	2½	3	3½	4	5	6	8 in.
Each	$ 6 25	8 75	11 50	15 00	24 00	33 00	65 00

MORTON CHECK VALVES.



DIRECTIONS FOR ATTACHING VALVE AND KEEPING IN ORDER.

1. Screw one-half of Valve on Delivery Pipe, leaving face up. 2. Insert Valve Seat with short face up. 3. Place Valve on Seat. 4. Screw the other half on Delivery Pipe leading to Boiler, leaving face down. 5. Slip the Yoke over and bring the two halves together, and secure them with Yoke and Set-Screw. Turn Set-Screw moderately.

To refit Valve, in case of accident, dress face of Valve and Seat with common mill file; then grind with oil and emery dust on any flat metallic surface.

NOTE.—Pack over and under the Valve Seat Flange with Flour-Sack Paper.

We are making a Valve especially for Inspirators and Injectors. The Cage or Guides to the Valve are made V-shaped, brought almost to a point next to the Valve. The water passing through the Valve has almost a free passage, and there is no chance for dirt to get between it and the Valve Cage, or Bars, while the Inspirator or Injector is in use.

PRICE LIST.

SIZES.	Outside Size of Valve.	Outside Size of Shell or Body.	Price.
½ inch Valve, complete	¾ inch.	2¼ inch.	$ 2 50
¾ inch Valve, complete	1¼ inch.	3 inch.	3 50
1 inch Valve, complete	1⅝ inch.	3¼ inch.	5 00
1¼ inch Valve, complete	1⅞ inch.	4½ inch.	7 00
1½ inch Valve, complete	2⅜ inch.	5 inch.	9 00
2 inch Valve, complete	2⅝ inch.	5½ inch.	10 00
2½ inch Valve, complete	3¼ inch.	6 inch.	12 00
3 inch Valve, complete	3¾ inch.	6½ inch.	15 00
3½ inch Valve, complete	4¼ inch.	7 inch.	20 00
4 inch Valve, complete	4¾ inch.	7½ inch.	25 00
4½ inch Valve, complete	5¼ inch.	8 inch.	30 00
5 inch Valve, complete	5¾ inch.	8½ inch.	35 00
5½ inch Valve, complete	6¼ inch.	9 inch.	40 00
6 inch Valve, complete	6¾ inch.	9½ inch.	50 00

All sizes of Valves fitted to standard sizes of Gas Pipe, and all sizes made with Flanges for connecting Pipe and Boiler, when desired.

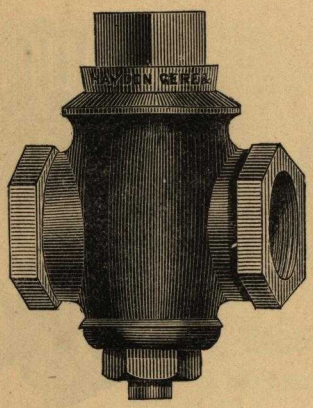
All sizes of Reversible Elbows, from one to six inches, fitted to standard sizes of Gas Pipe, or with Flanges.

In ordering Valves, please give size of inside Connecting Pipes, and state whether used for Inspirators, Injectors or Pumps.

IRON COCKS,

SQUARE HEAD.

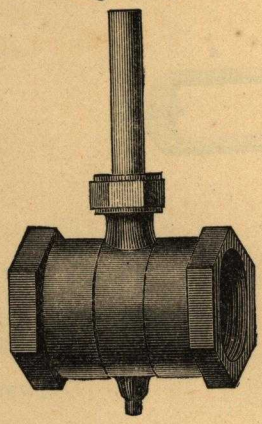
Fig. 758.



BUTTERFLY VALVES,

IRON BODY.

Fig. 696.



IRON COCKS, Square Heads, Screwed.

Fig. 758.

Size	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Each	$0 50	0 60	0 70	0 90	1 35	1 90	2 30	4 25	6 25	10 00	13 00	28 00	45 00

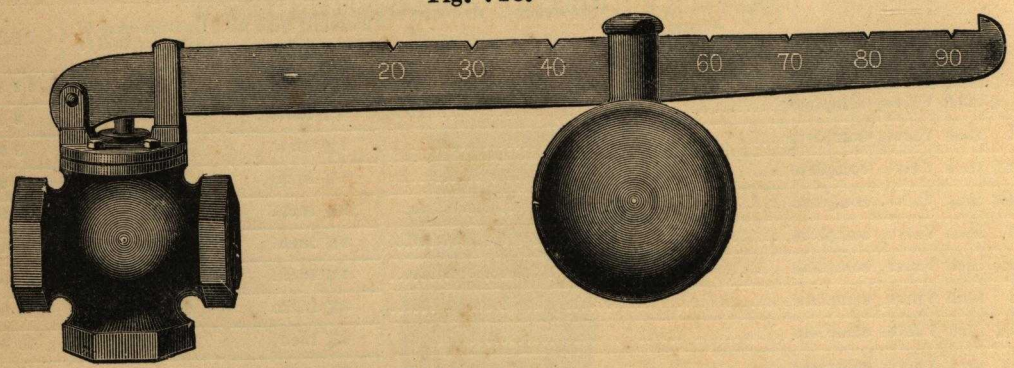
BUTTERFLY VALVES, Iron Body, Brass Mounted, Screwed.

Fig. 696.

Size	1¼	1½	2	2½	3	3½	4
Each	$3 50	4 50	6 00	8 00	12 00	16 00	20 00

GLOBE SAFETY VALVES, Iron Body.

Fig. 713.



GLOBE SAFETY VALVES, Iron Body, Brass Mounted, Screwed.

Fig. 713.

Size	1¼	1½	2	2½	3	3½	4	5	6	8
Each	$3 75	4 75	6 50	12 00	15 00	20 00	24 00	36 00	48 00	145 00

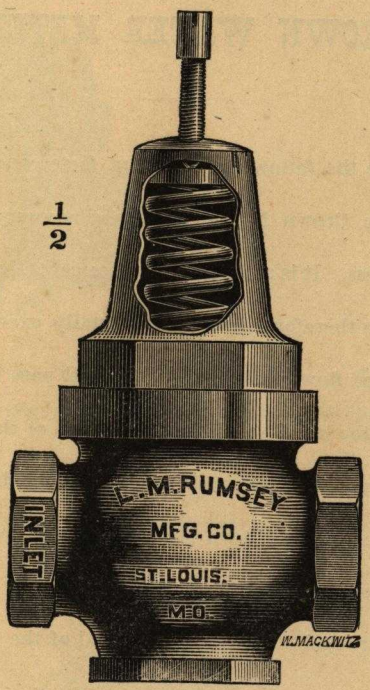
GLOBE SAFETY VALVES, Iron Body, Brass Mounted, Flanged.

Fig. 714.

Size	2	2½	3	3½	4	5	6	8
Each	$8 25	14 25	18 00	23 75	28 50	42 00	55 50	154 00

AUTOMATIC WATER PRESSURE REGULATOR.

(MUELLER & GROSS' PATENT, March 5th, 1878.)



AUTOMATIC WATER PRESSURE REGULATOR.

PRICES.

For ¾ inch Supply Pipes	$10 00
For 1 inch Supply Pipes	13 00

Regulator WARRANTED to maintain a UNIFORM PRESSURE, regardless of the pressure in the Mains.

Your attention is called to our AUTOMATIC WATER PRESSURE REGULATOR, filling a want where the Holly Water System, or a heavy or uncertain pressure, is had from any system of water works, either Reservoir or Stand Pipe.

Using our Regulator, we guarantee a steady and uniform pressure, WITHOUT ANY JAR TO THE PIPES, or any noise.

Any pressure may be secured that is desired, not exceeding the pressure in the mains, but may be of any less pressure.

The Regulator is simple of construction, and not liable to get out of order, and by attaching it, lighter Pipes may be used, and more than the expense of the Regulator saved.

NO SPLASHING OF WATER from too heavy a pressure; NO BURSTING OF PIPES OR BOILERS caused by excessive pressure or defective plumbing.

A pressure of twenty or thirty pounds, as may be desired, can be maintained in any building, notwithstanding a FIRE PRESSURE of 120 pounds or more is on the mains.

By using this Regulator an effective pressure for fire purposes is obtained sooner, as the House Supply Pipes are not filled to a fire pressure.

A Relief Valve is provided for expansion of hot water where Boiler is used, so that at no time there need be more than twenty or thirty pounds, or the amount pressure desired in the House Supply Pipes.

CROWN WATER METER.

We would respectfully urge the following important facts concerning our Crown Water Meter. The characteristic features of the Crown Meter are: great accuracy and durability, combined with extreme simplicity and compactness. It is a positive displacement Meter, having but one working part (a hard rubber roller piston), and is therefore almost, if not totally, exempt from liability to derangement. It offers no obstruction to the free flow of the water, but will pass all that the supply pipe furnishes, without reducing the pressure in the least—a distinctive feature of the highest importance in localities where the pressure is light. It measures equally well on all sized openings, whether the pressure be small or great. The interior construction of the Crown Meter is of brass and hard rubber, and, consequently, not liable to corrosion—an action which quickly destroys the efficiency of Meters built with iron interiors. By means of an ingeniously constructed stuffing box, the dial of the Crown Meter is preserved always perfectly clean and legible.

Particular care is bestowed upon the registering mechanism; all the gearing is cast in composition and enclosed in a case of the same metal, and every part is constructed and adjusted in the most careful and substantial manner. Notwithstanding its recognized superiority in point of efficiency, the Crown Meter is actually lower in price than greatly inferior Meters now in the market.

The wide-spread and rapidly growing demand for the Crown Meter is, perhaps, the best proof of the excellent satisfaction it gives wherever tried or introduced; that it is practically what we claim it to be—the most thoroughly efficient Water Meter now known or in use

The Crown Meter is now in constant use and active demand in some one hundred cities and towns in the United States, the Dominion of Canada and abroad, and a critical test and comparison of it with other designs is cordially invited.

CROWN METER ILLUSTRATIONS.

Fig. 1.

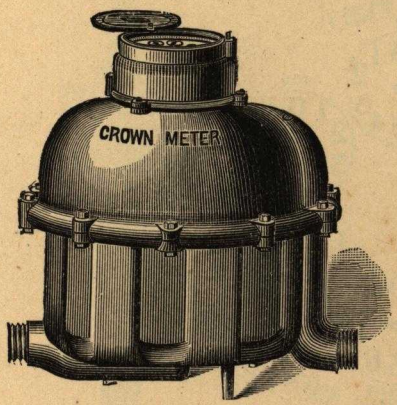


Fig. 2.

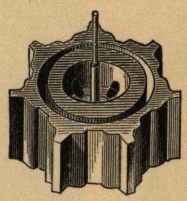


Fig. 1 is a perspective view of the Meter, showing the Index on the top. It is shown here as when placed in position. The proper threads at the Inlet and Outlet make it easy of attachment to the Supply and Discharge Pipes.

Fig. 2 is a view of the Hard Rubber Piston (the only working part of the Meter), with Spindle for moving the lever communicating with the intermediate gear, as shown in Fig. 3.

Fig. 3.

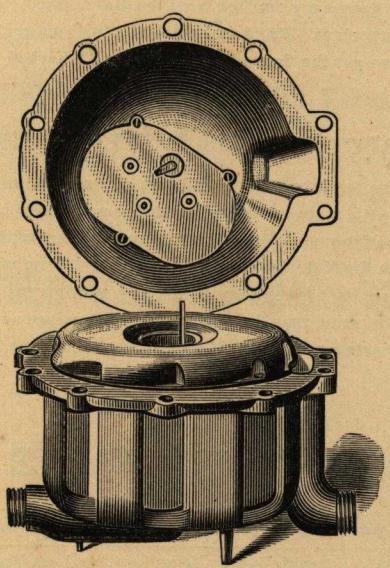
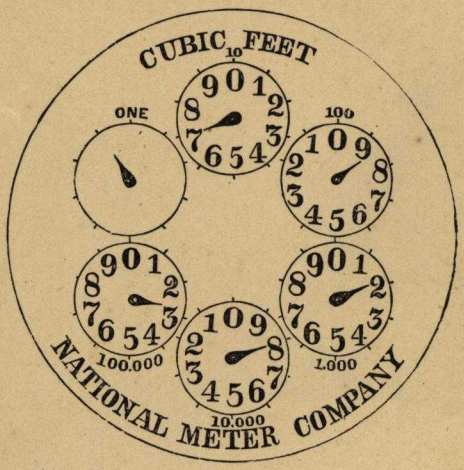


Fig. 3 gives a view of the Interior, with the Cover (or top of the Meter) thrown back.

The Vertical Shaft projecting through the Orifice in the Cover (or Cylinder Head) of the Meter, is the Spindle of the Rolling Piston (Fig. 2), and imparts motion to the Arm, or Lever, of the intermediate gear, which is enclosed in the elliptical-shaped case attached to the inside of the Cover. This Cover (presenting but a comparatively small surface to the water) is the only part of the Meter not made of composition.

CROWN METER INDEX.



CROWN METER INDEX.

This engraving shows the Counter of the Crown Meter. It registers cubic feet—one cubic foot being 7 48-100 U. S. gallons, and is read in the same way as the counters of gas meters.

The following example and directions may be of service to those unacquainted with the method:

If a pointer be between two figures, the smallest one must always be taken. When the pointer is so near a figure that it seems to indicate that figure exactly, look at the dial next below it in number, and if the pointer there has passed 0, then the count should be read for that figure. Let it be supposed that the pointers stand as in the above engraving; they then read 28,187 cubic feet. The figures are omitted from the dial marked "one," because they represent but tenths of one cubic foot, and hence are unimportant. From dial marked "10," we get 7; from the next, marked "100," we get 8; from the next, marked "1,000," we get the figure 1; from the next, marked "10,000," the figure 8; from the next, marked "100,000," the figure 2.

INSTRUCTIONS FOR SETTING THE METER.

When setting a Meter in position, let it be plumb, and properly secured to remain so. It should be well protected from frost. If used in connection with a steam boiler, or under any other conditions where it is exposed to a back pressure of steam or hot water, the Meter must be protected from contact with either by a check valve, which may be placed anywhere on the pipe between the Meter's outlet and the vessel from whence the steam or hot water is liable to emanate. It would be well to "blow out" the supply pipe before setting the Meter, so that if there be any acccumulation of sand, gravel, etc. in it, the same may be expelled, and thus prevented from entering the Meter, which it might harass, if not injure. Avoid using red lead. If used it works into the Meter, and may cause much annoyance by clogging the piston.

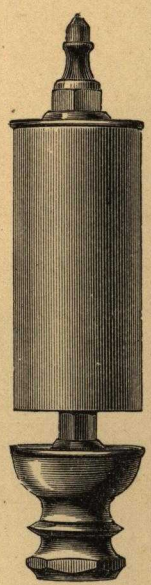
PRICE LIST CROWN WATER METERS.

Size.	Weight of Meter.	Capacity Crown Meter.	Capacity Worthington Meter.	Price.
⅝ inch.....	16 pounds.	2 cubic feet or 15 gallons.	⅝ inch Worthington Meter, 7½ gallons.	$16 00
¾ inch.....	28 pounds.	4 cubic feet or 30 gallons.	¾ inch Worthington Meter, 15 gallons.	27 00
1 inch.....	38 pounds.	8 cubic feet or 60 gallons.	1 inch Worthington Meter, 30 gallons.	36 00
1½ inch.....	50 pounds.	12 cubic feet or 90 gallons.	1½ inch Worthington Meter, 45 gallons.	65 00
2 inch.....	140 pounds.	20 cubic feet or 150 gallons.	2 inch Worthington Meter, 60 gallons.	88 00
4 inch.....	200 pounds.	36 cubic feet or 270 gallons.	3 inch Worthington Meter, 130 gallons.	172 00
4 inch.....	400 pounds.	72 cubic feet or 540 gallons.	4 inch Worthington Meter, 450 gallons.	350 00

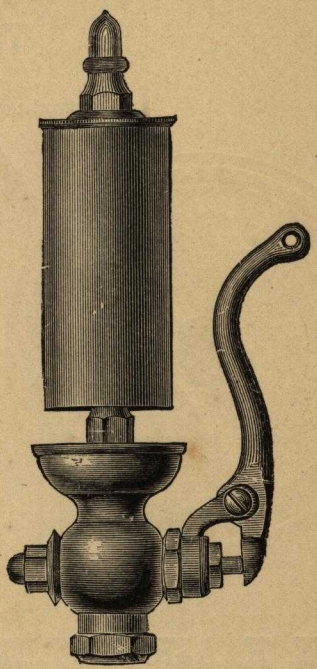
Boxing extra. Connections not furnished unless specially ordered, as regular pipe fittings will answer.

STEAM WHISTLES, All Brass.

No. 3, Fig. 468.



No. 9, Fig. 474.



STEAM WHISTLES, Long Bell, without Valve, all Brass.

No. 3, Fig. 468.

Diameter of Bell	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12
Each	$1 70	2 00	2 50	3 00	4 00	5 50	7 75	10 00	16 00	22 00	50 00	80 00	160 00

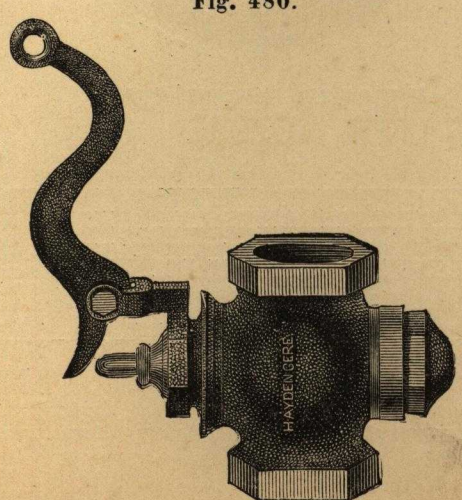
STEAM WHISTLES, Long Bell, with Valve, all Brass.

No. 9, Fig. 474.

Diameter of Bell	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12
Each	$3 50	3 75	4 00	4 25	5 50	7 00	9 50	12 00	19 00	25 00	65 00	125 00	250 00

WHISTLE VALVES, Steam Metal.

Fig. 480.



WHISTLE VALVES,

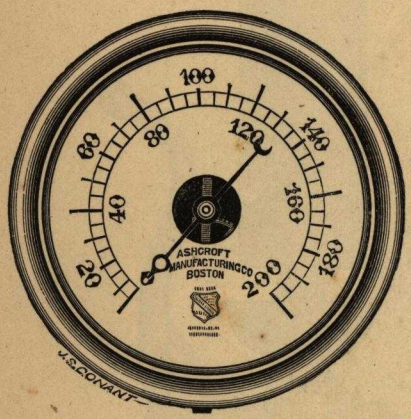
STEAM METAL.

Fig. 480.

Size	½	¾	1	1¼	1½	2	2½	3
Rough, each	$2 00	2 50	3 00	4 00	5 50	8 00	12 00	16 00
Finished, each.	2 50	3 00	3 75	5 00	6 50	9 50	14 00	20 00

THE ORIGINAL ASHCROFT "BOURDON SPRING" STEAM AND VACUUM GAUGES.

(Introduced by E. H. ASHCROFT in 1851.)



PRICES.

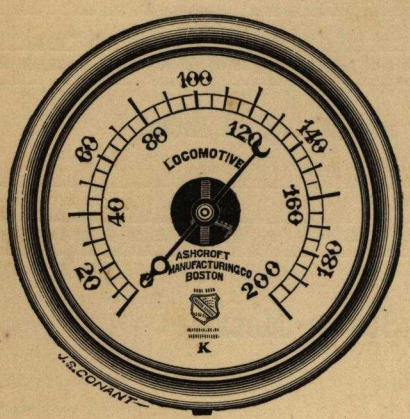
No. 0,	Brass	Case,	12	inch	Dial	$70 00
" 1,	"	"	10	"	"	40 00
" 1½,	Iron	"	10	"	"	30 00
" 2,	"	"	8½	"	"	30 00
" 3,	Brass	"	6¾	"	"	20 00
" 3½,	Iron	"	6¾	"	"	16 00
" 4,	Brass	"	6	"	"	16 00
" 5,	"	"	5½	"	"	12 00
" 6,	Iron	"	6	"	"	12 00
" 7,	"	"	5½	"	"	8 00
" 8,	Brass	"	4½	"	"	8 00
" 8½,	Iron	"	4½	"	"	6 00
" 9,	Brass	"	3½	"	"	8 00
" 9½,	Iron	"	3½	"	"	6 00
" 10,	Brass	"	2	"	"	8 00

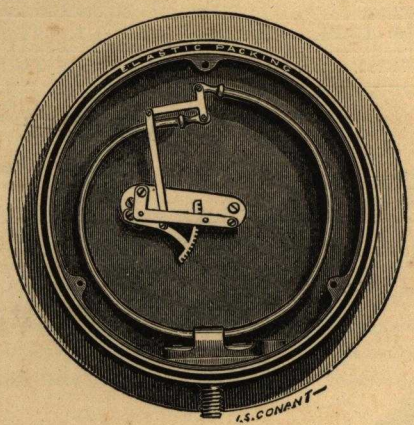
Octagon Rings for No. 1 to No. 3, $2.50 extra, net. Nickel-Plating charged at cost.

All Gauges graduated from open Mercury Column.

THE E. H. ASHCROFT IMPROVED "BOURDON" STEAM GAUGES,

FOR LOCOMOTIVES AND STEAM FIRE ENGINES





Interior view of "Improved Bourdon."

PRICES.

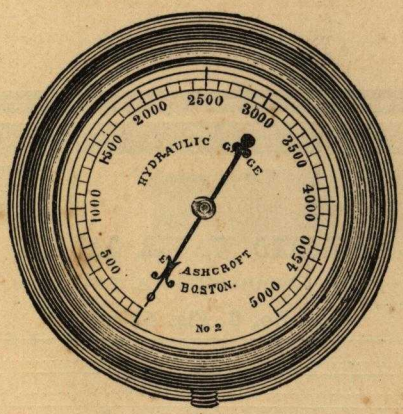
A No. 1,	Brass	Case,	10	inch	Dial	$42 00
A " 2,	"	"	8½	"	"	32 00
A " 3,	"	"	6¾	"	"	22 00
" 3½,	Iron	"	6¾	"	"	18 00
A " 4,	Brass	"	6	"	"	18 00
A " 5,	"	"	5½	"	"	14 00
" 6,	Iron	"	6	"	"	16 00
" 7,	"	"	5½	"	"	10 00

We will change old-style Gauges to Improved Bourdon, at a cost of from $5.00 to $8.00, and warrant them good as new. All Gauges tested from open Mercury Column.

This Gauge is provided with an elastic ring that effectually prevents all moisture caused by steam from Gauge-Cocks entering the interior of the Gauge and corroding the movement.

HYDRAULIC GAUGES,

FOR CAR-WHEEL PRESSES STRAW WORKS, ETC.



HYDRAULIC GAUGES,

FOR CAR-WHEEL PRESSES, STRAW WORKS, ETC.

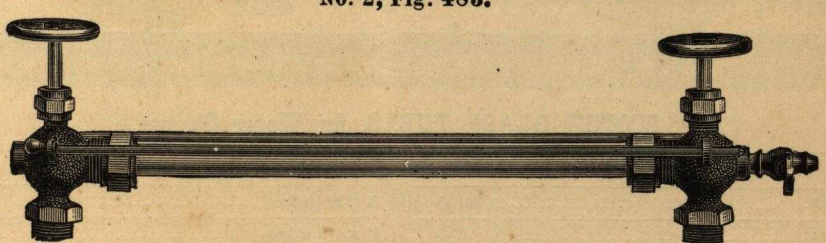
In order to meet a long-felt want in this direction, we have made a specialty of this class of goods, and have produced a Hydraulic Gauge which cannot be surpassed. The Spring used in this Gauge is of the Bourdon Pattern, made of heavy steel tubing. There being only a slight movement of the Spring to send the Hand around the Dial, the danger of setting is entirely overcome. We feel confident in saying it is the best Hydraulic Gauge in the market.

PRICES.

10 inch Dial, Brass Case, 2,000 to 20,000 pounds	$110 00
10 inch Dial, Iron Case, 2,000 to 20,000 pounds	100 00
8½ inch Dial, Brass Case, 2,000 to 16,000 pounds	80 00
8½ inch Dial, Iron Case, 2,000 to 16,000 pounds	65 00
6¾ inch Dial, Brass Case, 2,000 to 10,000 pounds	50 00
6¾ inch Dial, Brass Case, 500 to 1,000 pounds	25 00
6¾ inch Dial, Iron Case, 2,000 to 10,000 pounds	45 00
6 inch Dial, Brass Case, 1,000 to 6,000 pounds	40 00
6 inch Dial, Iron Case, 1,000 to 6,000 pounds	30 00

WATER GAUGES.

No. 2, Fig. 483.



ROUGH WATER GAUGES,

IRON WHEELS, TWO RODS.

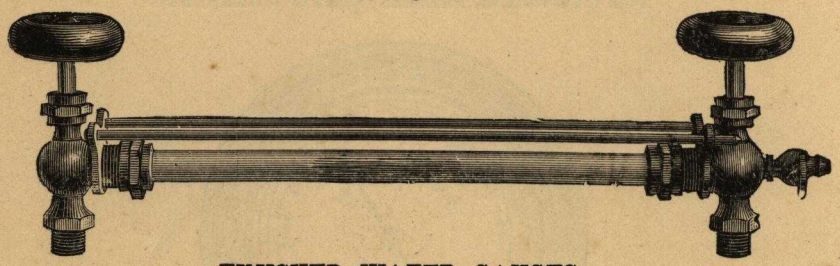
No. 2, Fig. 483.

Screwed for ½ inch Iron Pipe, Glass	⅝ x 12
Each	$2 75

FINISHED WATER GAUGES,

PATENT WOOD WHEELS, TWO RODS

No. 6, Fig. 487.



FINISHED WATER GAUGES,

PATENT WOOD WHEELS, TWO RODS.

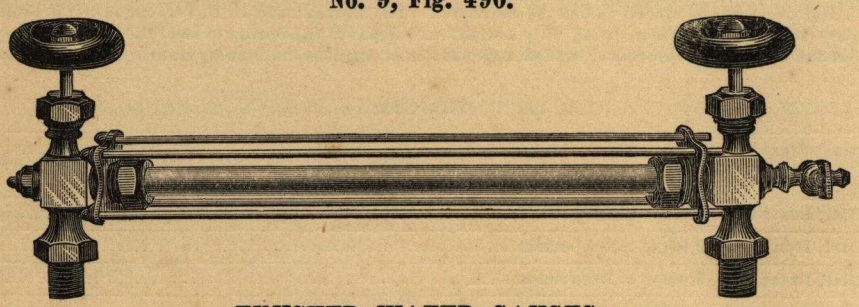
No. 6, Fig. 487.

Screwed for ⅜ inch Iron Pipe, Glass	⅝ x 12
Each	$4 00

FINISHED WATER GAUGES,

PATENT WOOD WHEELS, SQUARE BODY, FOUR RODS.

No. 9, Fig. 490.



FINISHED WATER GAUGES,

PATENT WOOD WHEELS, SQUARE BODY, FOUR RODS.

No. 9, Fig. 490.

Screwed for ⅜ inch Iron Pipe, Glass	⅝ x 12
Each	$4 00

SCOTCH GLASS TUBES, for Water Gauges.

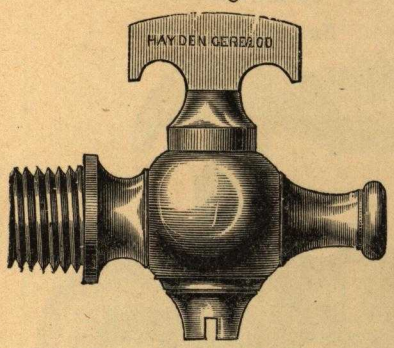
SCOTCH GLASS TUBES, for Water Gauges.

DIAMETER.	Price.	DIAMETER.	Price.
⅝ x 10 inches	$0 45	⅝ x 18 inches	$0 75
⅝ x 11 inches	0 45	¾ x 15 inches	0 65
⅝ x 12 inches	0 45	¾ x 16 inches	0 65
⅝ x 13 inches	0 45	¾ x 17 inches	0 70
⅝ x 14 inches	0 50	¾ x 18 inches	0 75
⅝ x 15 inches	0 55	¾ x 19 inches	0 80
⅝ x 16 inches	0 60	¾ x 20 inches	0 85
⅝ x 17 inches	0 65		

Every Tube warranted to stand 500 pounds pressure per square inch, and will not change color.

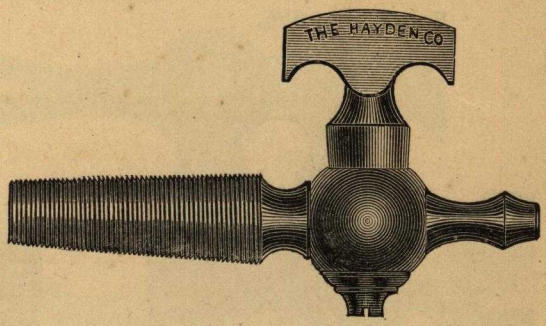
AIR COCKS.

No. 2. Fig. 574.



Screwed for ⅛, ¼, ⅜ and ½ inch Iron Pipe.

No. 7. Fig. 579.



Taper Shank.

AIR COCKS.

No. 2. Fig. 574.

Size, inches	⅛	¼	⅜	½
Finished, per doz	$ 5 00	5 00	5 50	6 00

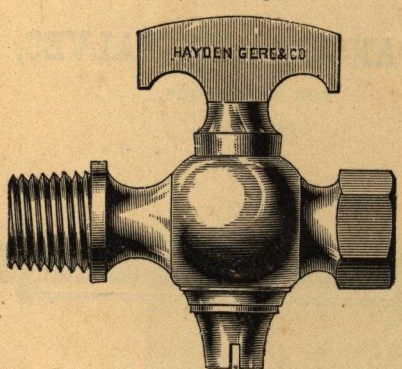
AIR COCKS, Taper Shank.

No. 7. Fig. 579.

Size, inches	⅛
Finished, per doz	$ 5 00

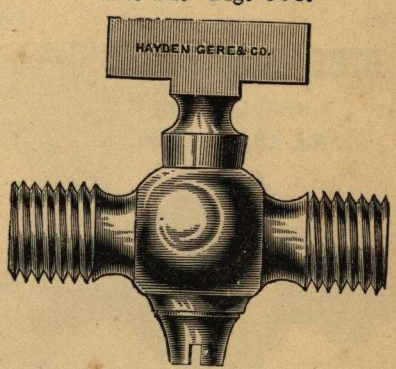
AIR COCKS.

No. 10. Fig. 582.



With Square Head.

No. 11. Fig. 583.



Both Ends Screwed.

AIR COCKS, with Square Head.

No. 10. Fig. 582.

Size, inches	⅛	¼
Finished, per doz	$7 00	7 00

AIR COCKS, Both Ends Screwed.

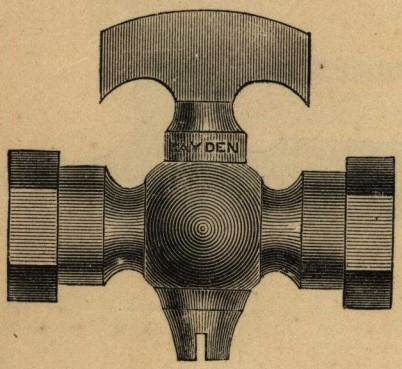
No. 11. Fig. 583.

Size, inches	⅛	¼	⅜
Finished, per doz	$5 50	5 50	6 50

AIR COCKS,

FEMALE THREAD BOTH ENDS, T HANDLE.

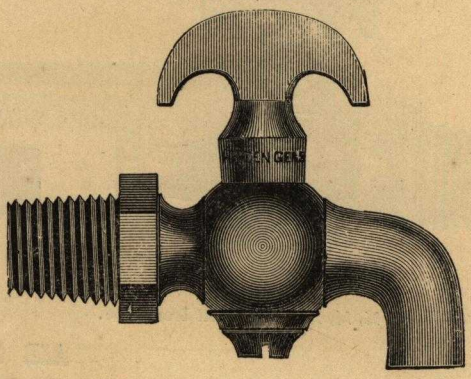
No. 13, Fig. 585.



BIBB AIR COCKS,

WITH T HANDLE.

No. 14, Fig. 586.



AIR COCKS, Female Thread Both Ends, T Handle.

No. 13, Fig. 585.

Size	⅛	¼
Finished, per doz	$8 00	8 00

BIBB AIR COCKS, with T Handle.

No. 14, Fig. 586.

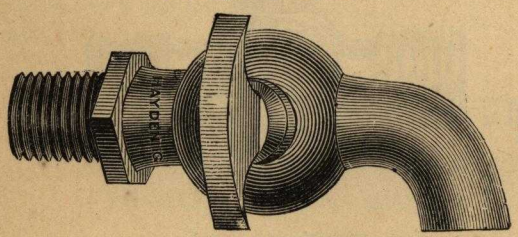
Size	⅛	¼	⅜
Finished, per doz	$7 00	7 00	9 00

Finished Taper Shank, per dozen, same price.

BIBB AIR COCKS,

T HANDLE ON SIDE.

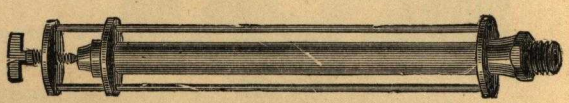
No. 18, Fig. 590.



EXPANSION AIR VALVES,

FOR RADIATORS.

Fig. 572.



BIBB AIR COCKS, T Handle on Side.

No. 18, Fig. 590.

Size	⅛	¼	⅜
Finished, per doz	$7 00	7 00	9 00

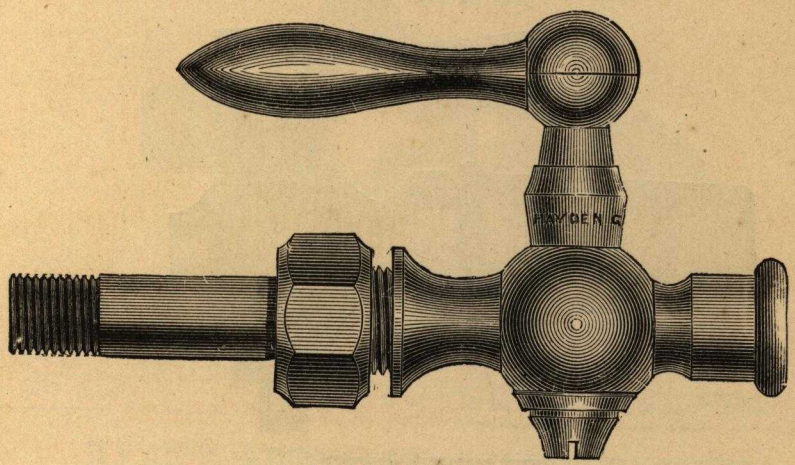
EXPANSION AIR VALVES, for Radiators.

Fig. 572.

Size	⅛	¼
Finished, per doz	$18 00	18 00

STEAM GAUGE COCKS.

No. 3, Fig. 594.



STEAM GAUGE COCKS.

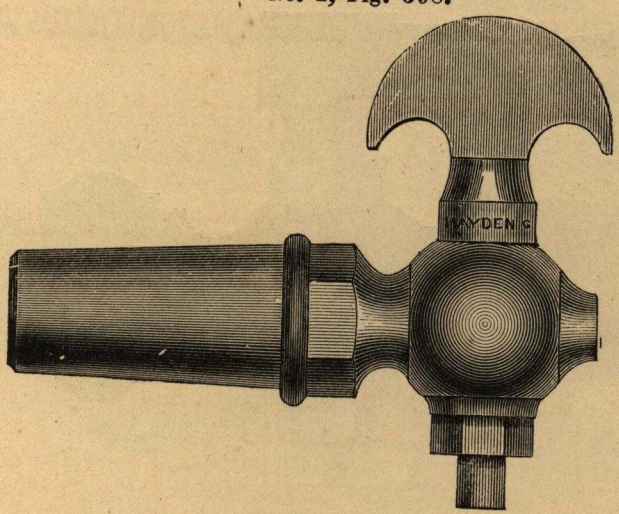
No. 3, Fig. 594.

Size, inches	¼
Finished, per doz	$15 00

CYLINDER COCKS,

FULL SIZE.

No. 4, Fig. 598.



CYLINDER COCKS,

T HANDLE.

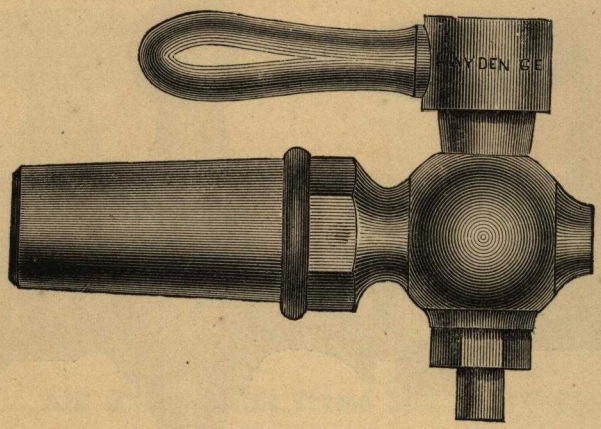
No. 4, Fig. 598.

Diameter of Blank Shank	⅜	½	⅝	¾	⅞
Finished, per doz	$5 50	7 00	8 00	10 50	13 00

CYLINDER COCKS,

LEVER HANDLE.

No. 8, Fig. 602.



CYLINDER COCKS,

BLANK SHANK, LEVER HANDLE.

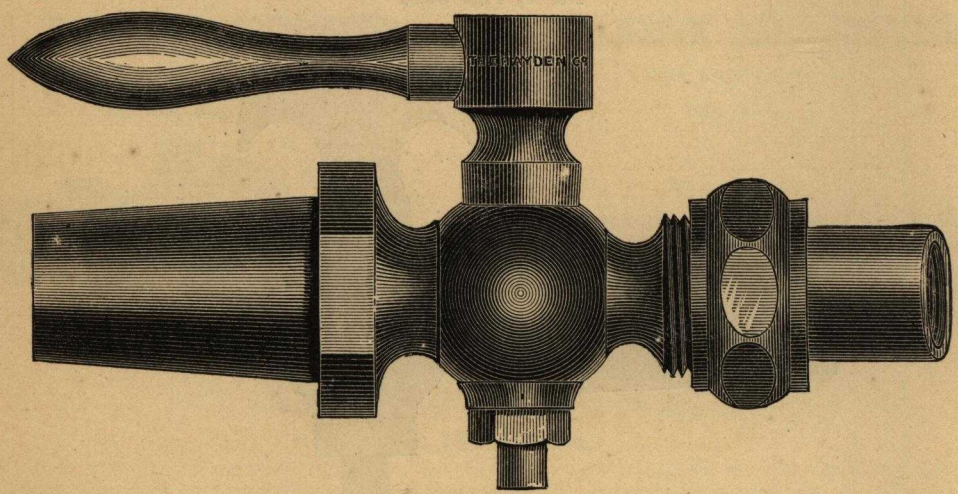
No. 8, Fig. 602.

Diameter of Blank Shank	⅜	½	⅝	¾	⅞	1⅛
Finished, per doz	$6 00	7 50	9 00	12 00	16 00	24 00

CYLINDER COCKS,

LEVER HANDLE, TAPER SHANK, WITH UNION.

No. 22, Fig. 616.



CYLINDER COCKS,

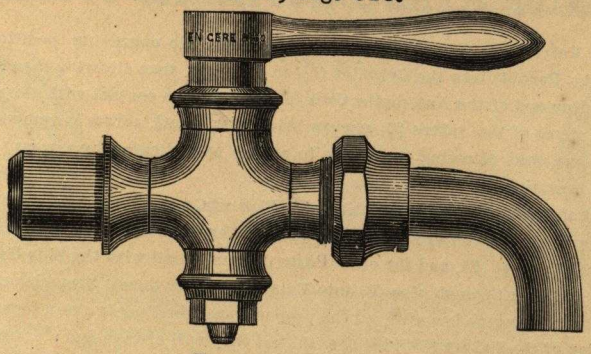
LEVER HANDLE, TAPER SHANK, WITH UNION.

No. 22, Fig. 616.

Diameter of Blank Shank	⅜	½	⅝	¾	⅞	1⅛
Finished, per doz	$12 00	13 00	15 00	20 00	24 00	36 00

CYLINDER COCKS, Lever Handle, Bent Coupling.

No. 21, Fig. 615.

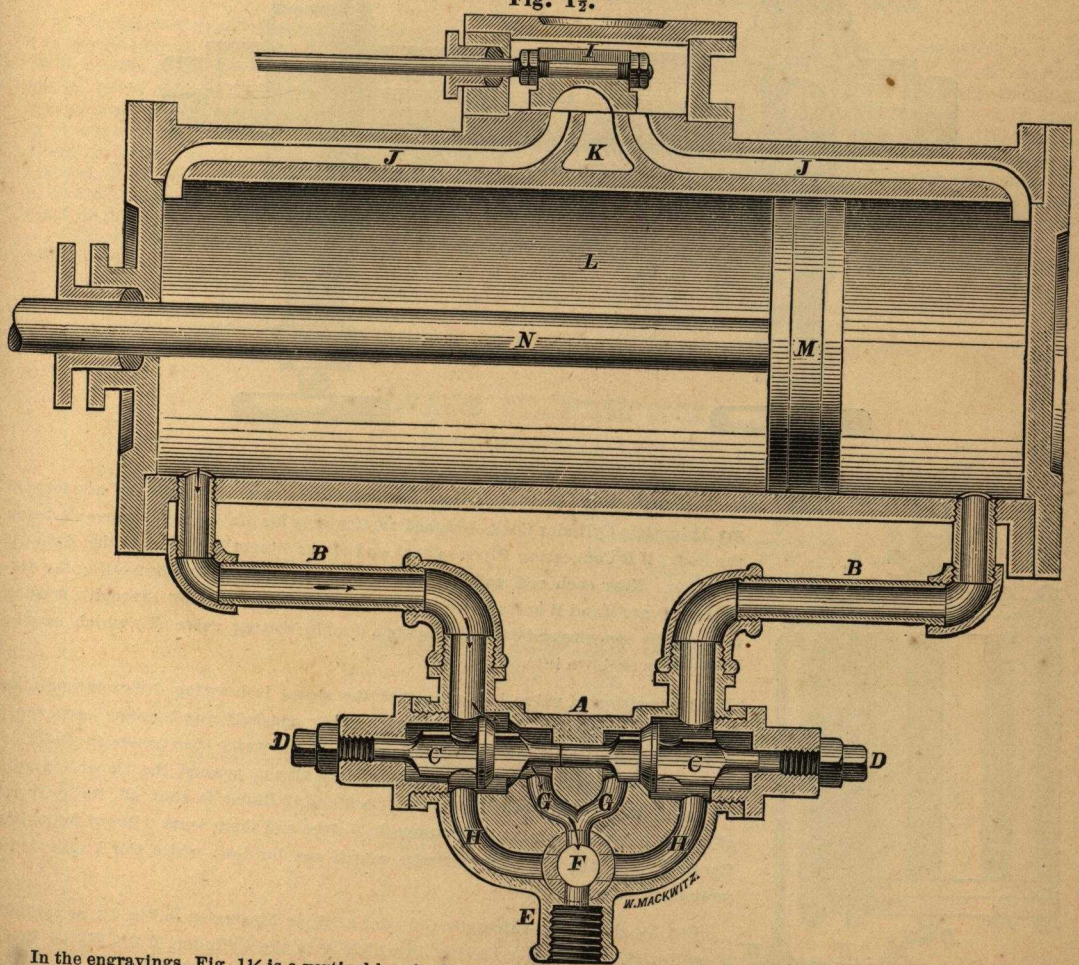


No. 21, Fig. 615.

Diameter of Blank Shanks, inches.....	¾	⅞	⅞	1⅛	1⅛	1⅜	1⅞	2
Diameter of Opening.....	¼	⅜	½	⅝	¾	1	1¼	1½
Finished, per doz.....	17 00	22 00	31 00	40 00	50 00	72 00	95 00	120 00

RYAN'S AUTOMATIC CYLINDER COCKS.

Fig. 1½.



In the engravings, Fig. 1½ is a vertical longitudinal section of my smallest form of Automatic Cylinder Cock, shown as applied to a horizontal Slide Valve Engine, in which A is the Cock and B B the Connecting Pipes to each end of the Cylinder; C C are two Wing Valves abutting against each other at one end; D D are the caps forming the end of the Valve Chamber; said caps are provided with adjusting screws to regulate the throw of the Valves; E is the Discharge Opening; F is the Plug Valve for directing the discharge, either through the valves C C and passages G G, or direct from the Cylinder through passages H H.

DESCRIPTION OF RYAN'S AUTOMATIC CYLINDER COCKS.

The operation of the Valve is as follows: As may be seen by the engraving, position of the Slide Valve (I) is admitting steam through the Port (J) into the Cylinder (L) on the right, thus allowing the steam to pass down the Side Pipe (B) into the corresponding end of the Automatic Cock, and, coming in contact with the rear of Valve (C), closes it tight against its seat [the stems of the valves (C) always being in contact], serves to remove the valve on the opposite end of the Cock from its seat, thus allowing the water to escape as indicated by arrows. This operation will continue so long as the Engine is working.

Should a large amount of water accumulate in the Steam Pipe while the Engine is at rest, it would be necessary to remove this as quickly as possible. To do this, I turn the plug (F) at the bottom so that the Port as indicated in dotted lines will lead direct to the Exhaust (E), and the other Ports to correspond with the Side Passages (H H), giving a free opening for water from the Cylinder through pipe (B) into Valve Chamber, thence through passages (H H), Plug (F) and Exhaust Opening (E). After the Engine has attained the proper speed the Plug is again turned to the position as shown in Fig. 1½. The construction of the Valves (C C) being such that they will always find a perfect Seat, being guided at one end in the Cap and on the other in the centre forming the divide of the Valve Chambers.

Fig. 2½.

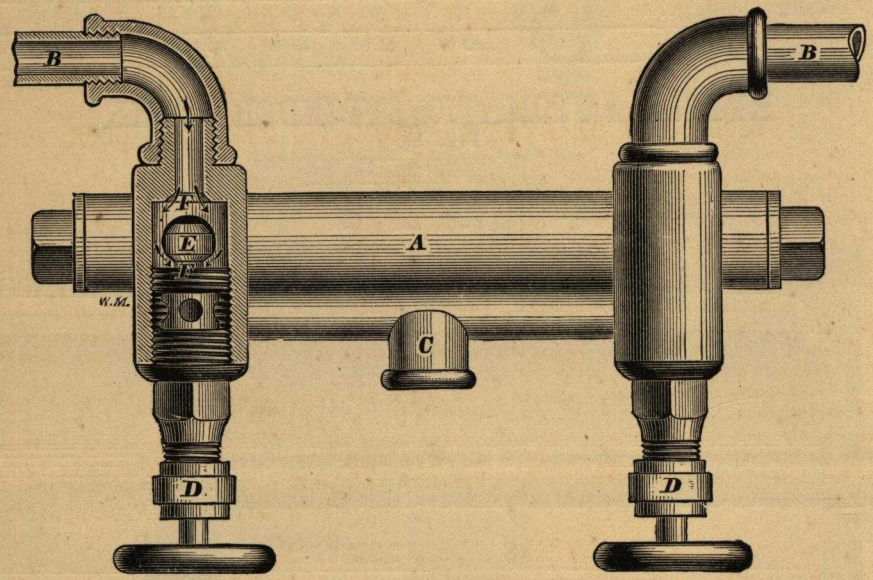


Fig. 3½.

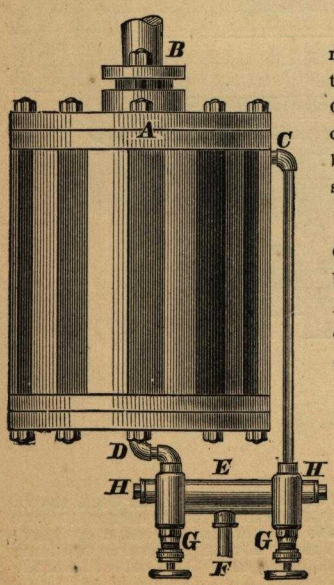


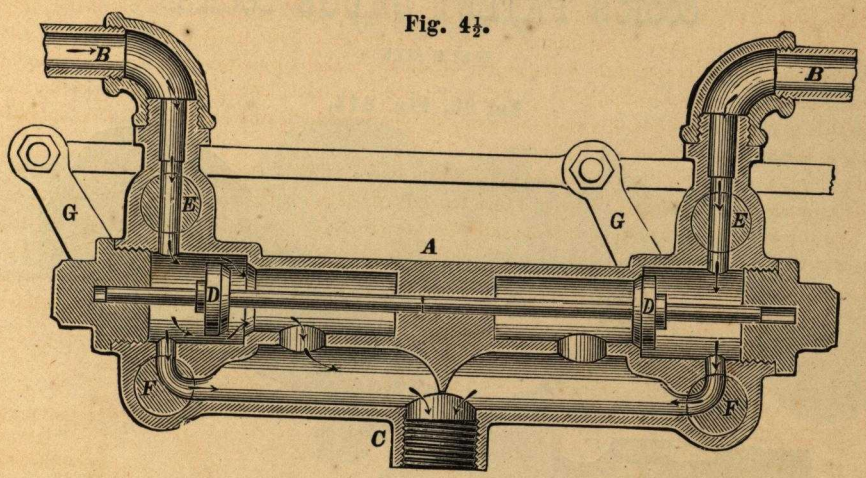
FIG. 2½ of the engraving shows a side elevation partly in section of one form of my Automatic Cylinder Cock, designed particularly for Stationary Engines; A being the Cock, B B Connecting Pipes to each end of the Steam Cylinder, C the Exhaust Opening. Near each end, and to one side, are two valves for controlling the discharge, D are Hand Wheels secured to one end of a stem passing through a stuffing box, on the opposite end of said stem is a double seating valve (E) which may be screwed up or down into Seats F F.

The position of valve indicates that the steam is blowing direct through the Cock before starting the Engine, the valve being one-half way between each Seat; by screwing the Valve down into the Lower Seat the water then passes through the Automatic Valves alone, and by screwing the Valve up against the Upper Seat, all communication between the Automatic Cock and Cylinder is shut off, the purpose of which being to examine the Automatic Valves and their Seats without removing the Cock from the Cylinder entirely, which can be done while the Engine is in motion, if necessary.

FIG. 3½ shows the Automatic Cylinder Cock, as illustrated in Fig. 2½, as applied to an Upright or Elevator Engine, in which A is the Cylinder, B the Piston Rod, C the Connecting Pipe to top of Cylinder, D the Connecting Pipe to the bottom of the Cylinder, E the Automatic Cylinder Cock, F the Exhaust Opening, G G the Controlling Valves, H H the Cap forming end of Automatic Valve Chamber.

DESCRIPTION OF RYAN'S AUTOMATIC CYLINDER COCK—Cont'd.

Fig. 4½.



DESCRIPTION OF RYAN'S AUTOMATIC CYLINDER COCK.

Fig. 4½ shows another form of Cylinder Cock, such as would be desired for marine engines or locomotives, in which (A) is cock proper, having the connecting pipes (B B) to each end of the cylinder, and exhaust port (C) at the bottom, (D D) are the automatic valves, secured on suitable stems and abutting together at the centre, said stems at one end are guided in recesses in the caps, and at the other in the divide between the valve chambers; from the bottom of the valve chamber are two openings leading into the chamber beneath the valve chamber; (E E) are two plug valves situated in the supply pipe at each end of the cock to entirely shut off connection with the cylinder; (F F) are the two plug valves at each end of the cock beneath the valve chamber, for the purpose of giving a free opening from the cylinder when starting the engine; (G G) are two cranks secured on the end of valves (F F) by which they are operated, the cranks (G G) are connected by a rod so they may be operated simultaneously, said rod may extend to any point within easy reach of the engineer in charge.

The engraving shows the cocks as all open as would be the case in starting the engine: the direction of the water being indicated by arrows.

It will be seen that all my Automatic Cylinder Cocks are provided with caps on the end of the valve chamber, which may be easily removed to get at the automatic valves, should it be desirous of examining them.

The general construction and operation of the automatic valves are alike in the various forms of cylinder cocks as shown.

RYAN'S CYLINDER COCK,

SINGLE PLUG OR KEY.

Fig. 1 1-2.

Size	¼	⅜	½	¾	1	1¼ in.
Each	$7 00	9 00	12 00	16 00	22 00	30 00

Larger sizes to order.

RYAN'S CYLINDER COCK,

DOUBLE VALVE.

Figs. 2 1-2 and 3 1-2.

Size	¼	⅜	½	¾	1	1¼ in.
Each	$8 00	10 00	15 00	24 00	33 00	42 00

RYAN'S CYLINDER COCK,

MARINE.

Fig. 4 1-2.

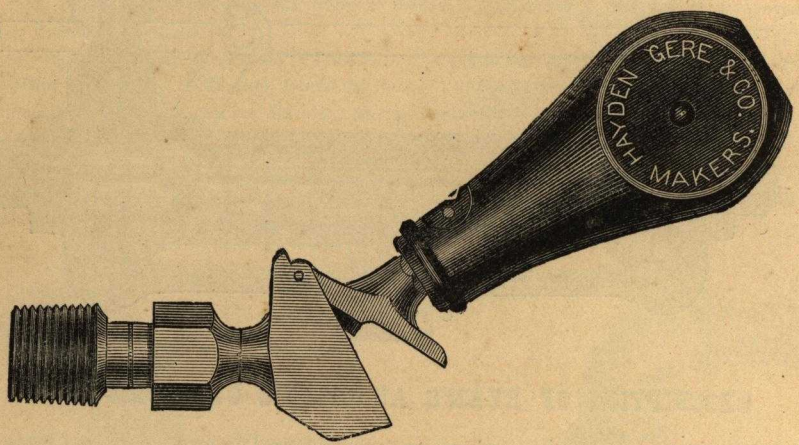
Size	¾	1	1¼ in.
Each	$20 00	26 00	35 00

This Cock can be used in wells where Pumps are located a long distance from the surface.

COOK'S PATENT GAUGE COCKS,

HALF SIZE.

No. 20, Fig. 645.



GAUGE COCKS,

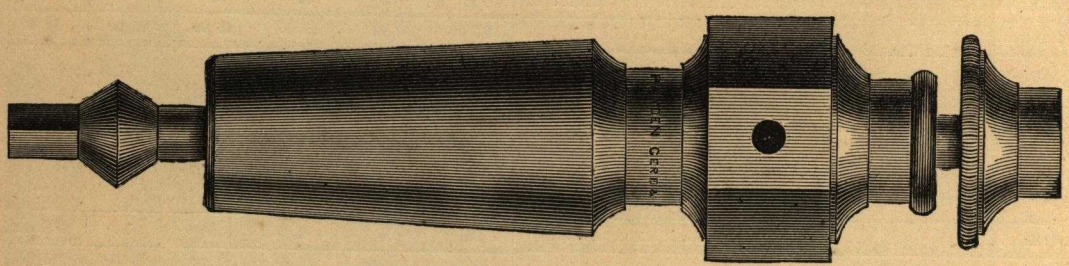
WEIGHTED.

No. 20, Fig. 645.

Size, inches	⅜	½	¾
Finished, per doz	$18 00	18 00	18 50

MISSISSIPPI GAUGE COCKS.

No. 1, Fig. 651.



MISSISSIPPI GAUGE COCKS.

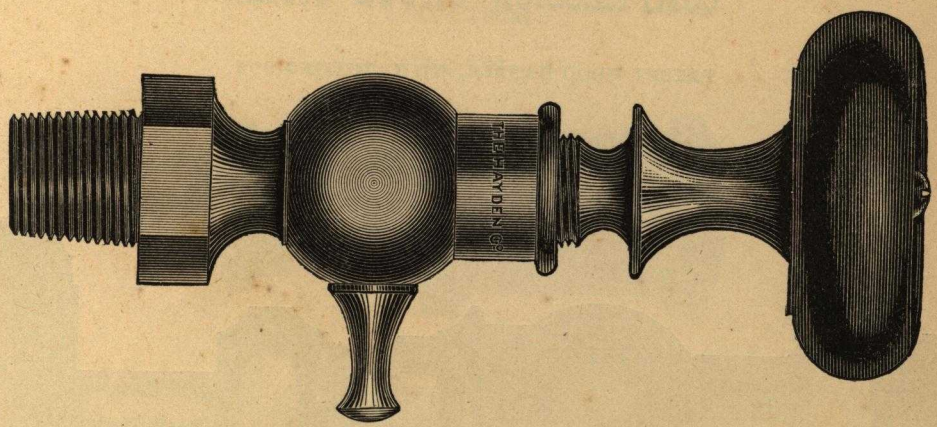
No. 1, Fig. 651.

Diameter of Blank Shanks, inches	½	⅝	¾	⅞	1	1⅛	1¼
Finished, per doz	$ 8 50	9 50	10 50	14 00	18 00	21 00	30 00

COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLES, FULL SIZE.

No. 3, Fig. 628.



COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLES

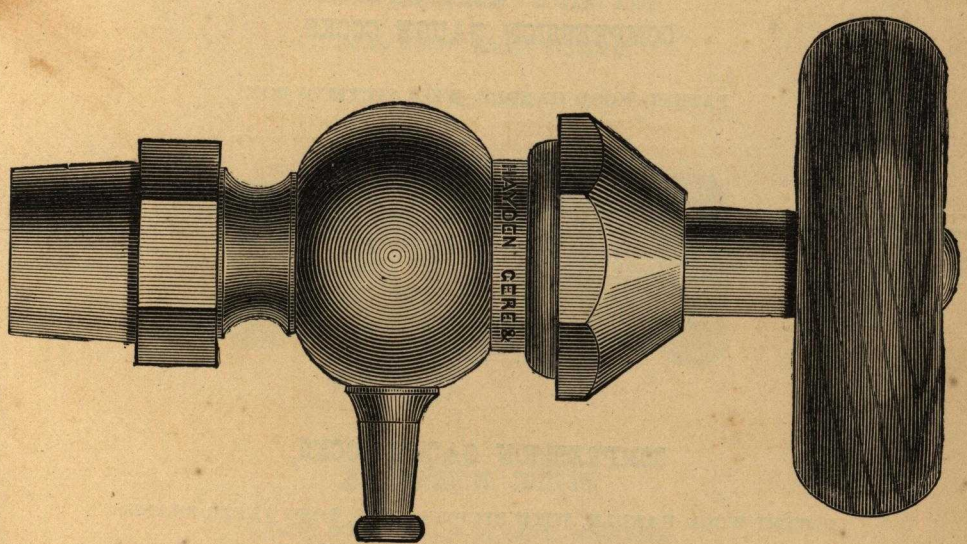
No. 3, Fig. 628.

Size	⅜	½	¾
Finished, per doz	$12 50	13 00	13 50

COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLES, FULL SIZE.

No. 5, Fig. 630.



COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLES, WITH STUFFING BOX.

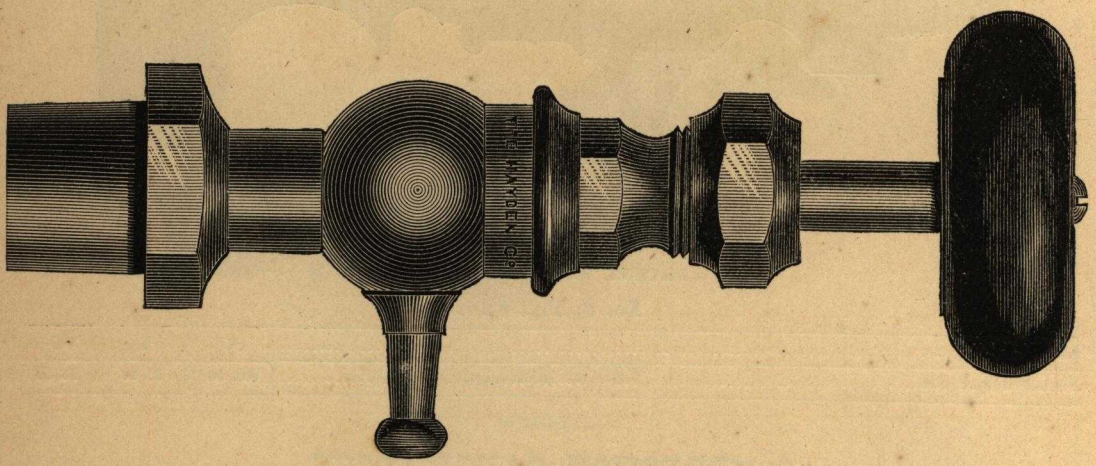
No. 5, Fig. 630.

Diameter of Blank Shank	⅞
Finished, per doz	$15 00

COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLE, WITH STUFFING BOX.

No. 6, Fig. 631.



COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLE, WITH STUFFING BOX.

No. 6, Fig. 631.

Diameter of Blank Shank	⅞ in.
Finished, per doz	$16 00

COMPRESSION GAUGE COCKS,

PATENT WOOD HANDLE, WITH STUFFING BOX, LONG TAPER SHANK.

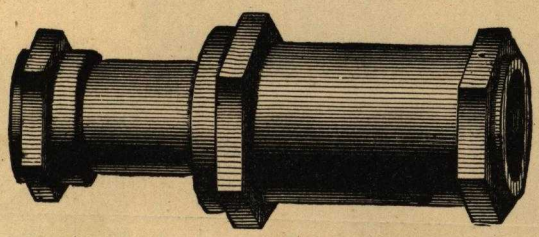
No. 9, Fig. 634.

Diameter of Blank Shank	1⅛ in.
Finished, per doz	$36 00

EXPANSION JOINTS,

STEAM METAL.

Fig. 781.



EXPANSION JOINTS,

STEAM METAL, SCREWED.

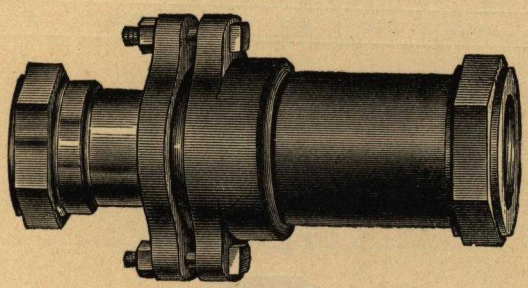
Fig. 781.

Size, inches	¾	1	1¼	1½	2
Each	$ 2 00	2 75	4 00	5 50	8 00
Length of Traverse, inches	1¾	2	2½	2¾	4

EXPANSION JOINTS,

IRON BODY, BRASS SLEEVE.

Fig. 782.



EXPANSION JOINTS,

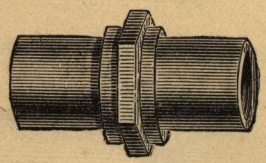
IRON BODY, BRASS SLEEVE, SCREWED.

Fig. 782.

Size, inches	2½	3	3½	4	5	6
Each	$12 00	16 00	24 00	28 00	40 00	50 00
Standard Length of Traverse, inches	5	6	6	6	6	6

GROUND UNION JOINTS.

Fig. 789.



GROUND UNION JOINTS.

Fig. 789.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Each	$0 40	0 50	0 70	0 90	1 35	1 80	2 25	3 75	5 50	7 00

BRASS BUSHINGS,

ROUND.

Fig. 812.

BRASS BUSHINGS,

ROUND.

Fig. 812.

Size	⅛ x ¼	¼ x ⅜	⅜ x ½	½ x ¾	¾ x 1	1 x 1¼	1¼ x 1½	1½ x 2	2 x 2½	2½ x 3
Each	$0 04	0 06	0 08	0 12	0 15	0 25	0 40	0 50	1 00	2 00

BRASS BUSHINGS,

HEXAGON.

Fig. 813.

BRASS BUSHINGS,

HEXAGON.

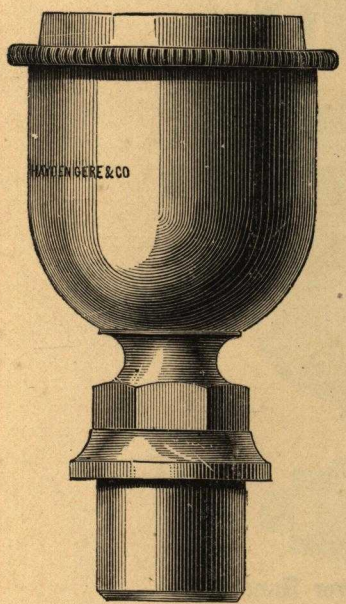
Fig. 813.

Size	⅛ x ¼	¼ x ⅜	⅜ x ½	½ x ¾	¾ x 1	1 x 1¼	1¼ x 1½	1½ x 2	2 x 2½	2½ x 3
Each	$0 04	0 06	0 08	0 12	0 15	0 25	0 40	0 50	1 00	2 00

PLAIN OIL CUPS,

WITH TUBE.

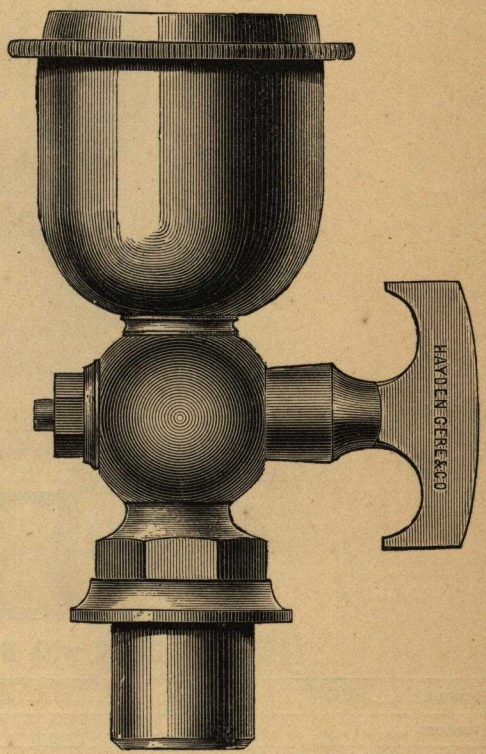
Fig. 508.



OIL CUPS

WITH STOP COCK, T HANDLE.

Fig. 532.



PLAIN OIL CUPS,

WITH TUBE.

Fig. 508.

Figures	502	503	504	505	506	507	508	509	510	511	512	513	514
Number	1	2	3	4	5	6	7	8	9	10	11	12	13
Diameter	⅝	¾	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½	2¾	3
Each	$0 24	0 28	0 33	0 38	0 44	0 56	0 75	0 95	1 20	1 60	2 10	2 60	3 25

OIL CUPS,

WITH STOP COCK, T HANDLE.

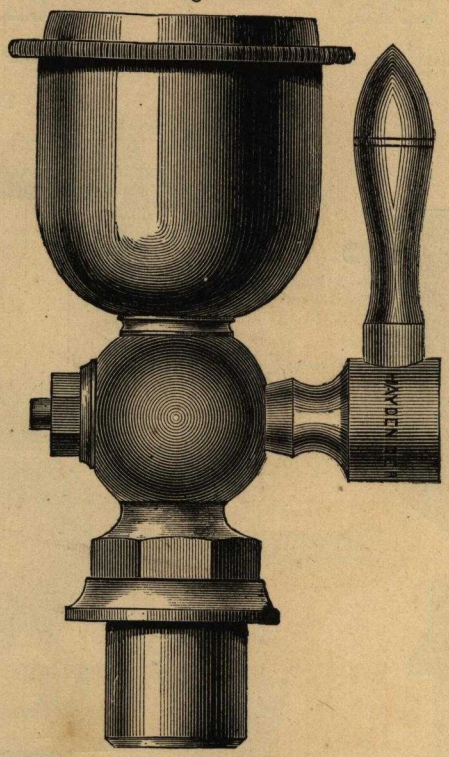
Fig. 532.

Figures	529	530	531	532	533	534
Number	28	29	30	31	32	33
Diameter	1	1⅛	1¼	1½	1¾	2
Each	$0 75	0 90	1 15	1 35	1 75	2 25

OIL CUPS,

WITH STOP COCK, LEVER HANDLE

Fig. 538.

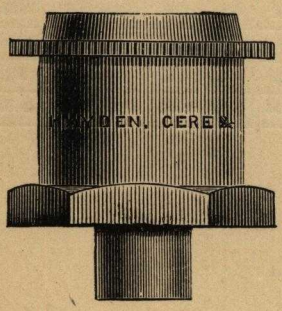


OIL CUPS, with Stop Cock, Lever Handle.

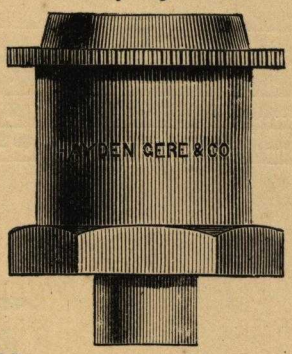
Figures	535	536	537	538	539	540
Numbers	34	35	36	37	38	39
Diameter of Blank Shanks, inches	1	1⅛	1¼	1½	1¾	2
Each	$0 80	0 95	1 25	1 50	2 00	2 50

LOCOMOTIVE OIL CUPS.

No. 3, Fig. 498.



No. 4, Fig. 499.



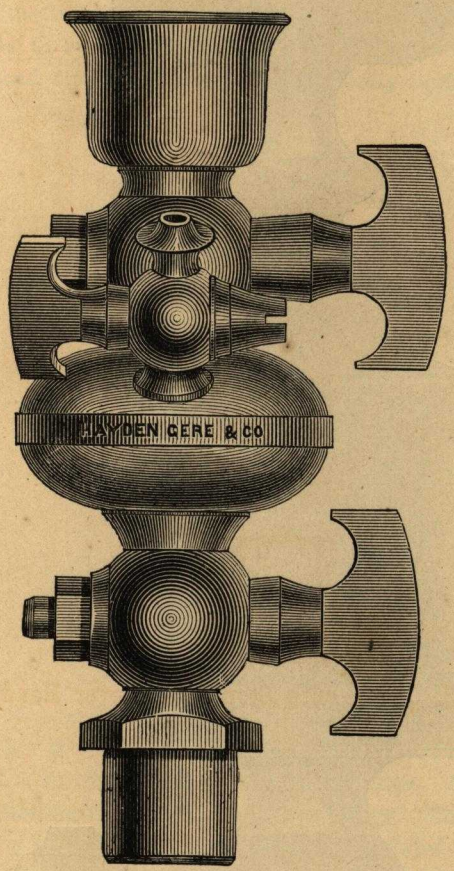
LOCOMOTIVE OIL CUPS.

Figures	496	497	498	499	500	501
Numbers	1	2	3	4	5	6
Diameter of Blank Shanks, inches	¾	⅞	1	1¼	1½	2
Each	$0 34	0 40	0 44	0 66	0 85	1 50

GLOBE OIL CUPS,

FULL SIZE.

No. 1, Fig. 558.



GLOBE OIL CUPS,

WITH AIR COCK.

No. 1, Fig. 558.

Number	1	2	3	4	5	6
Diameter	1½	2	2¼	2½	3	3½
Each	$3 00	3 75	4 50	5 25	6 00	7 50

COMPRESSION GLOBE OIL CUPS,

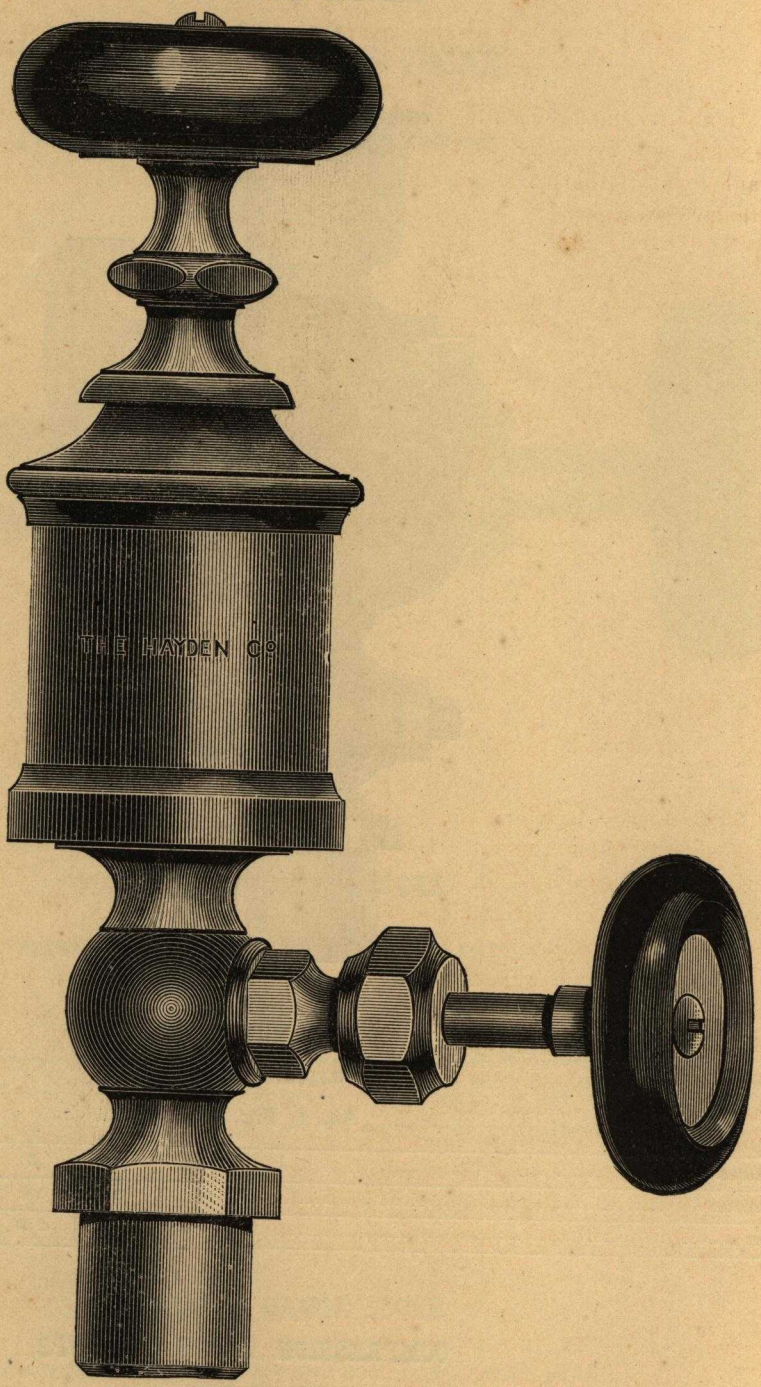
WITH AIR COCK.

Fig. 560.

Number	1	2	3	4	5	6
Diameter	2	2¼	2½	3	3½	4
Each	$4 25	4 75	5 50	6 50	9 00	13 00

LUBRICATORS, Patent Wood Handles, Full Size.

No. 3, Fig. 549.

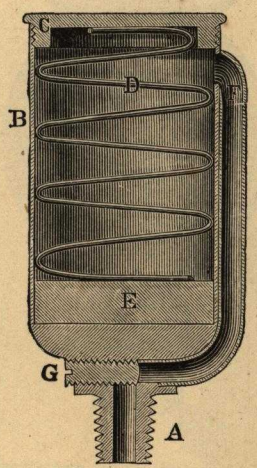


LUBRICATORS.

Figure	547	548	549	550	551	552	553	554
Number	1	2	3	4	5	6	7	8
Diameter	1	1¼	1½	1¾	2	2¼	2½	3
Each	$1 60	1 85	2 10	2 35	2 65	3 00	3 50	4 25

LOOSE PULLEY LUBRICATOR.

In the accompanying illustration we show the best and most reliable Loose Pulley Oiler in the world, so constructed as to be automatically controlled by the speed of the pulley. The arrangement of the parts and their functions will be readily understood by reference to the sectional view shown:



The reservoir B, which can be filled with oil by unscrewing the lid C, contains a piston and spiral spring. When the pulley to which the lubricator is attached revolves, the piston or weight E is moved toward the lid C by the action of centrifugal force. A pressure will therefore be exerted upon the oil corresponding to the velocity of the pulley. The oil is forced through the feed-pipe F to the nozzle A, on to the shaft. The supply is regulated by the screw G, which may be set so that the entire reservoir is emptied in fifteen minutes, or that the amount will last for weeks. As soon as a proper aperture for G has been ascertained by experiment, the oiling of the pulley requires no attention. When the pulley stops, the flow of oil stops also. The spring carrying the weight back sucks all the oil out of the feed-pipe into the reservoir, so that no oil is wasted or spilled—a fact which, it will be readily understood, brings, besides the advantage of economy, that of absence of soiling of fabrics, of soaking of belts with oil, and other inconveniences incident to the present methods of lubrication. These Lubricators, which are adapted to pulleys from six inches in diameter and upwards, are screwed into the pulley hub, an operation easily performed by tapping out the oil hole, which can be done without removing it from the shaft.

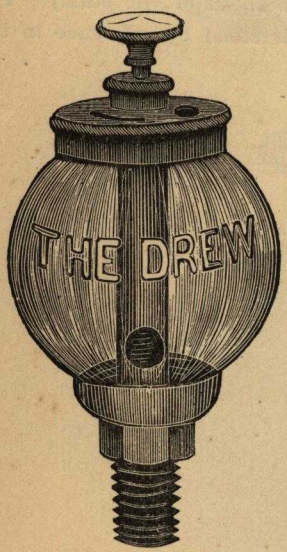
SIZES AND PRICES.

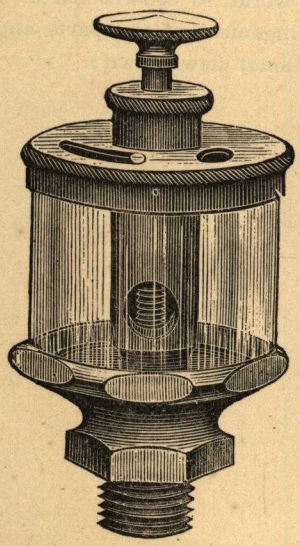
No. 0 size, per dozen	$14 00
No. 1 size, per dozen	14 50
No. 2 size, per dozen	15 00

The No. 0 size is adapted for pulleys from six to 8 inches diameter. The No. 1 size for pulleys from 8 to 14 inches diameter. The No. 2 size for pulleys from 14 inches and upwards, also for presses.

DREW'S SHAFTING AND ENGINE SELF-OILERS.

GLOBE PATTERN, FOR SHAFTING. GLOBE PATTERN, FOR ENGINE. STRAIGHT PATTERN, FOR ENGINE.





These are strongly made, with heavy shoulders and stems, and sizes to suit all engines, and we recommend them to the notice of engine builders and engineers.

PRICE LIST FOR GLOBE PATTERN.

	Per Doz.
No. 1, for Loose Pulleys, 1¼ inch Globe	$12 00
No. 2, for Shafting, 2¼ inch Globe	16 00
No. 3, for Shafting, 3 inch Globe	24 00
No. 2, Engine, 2¼ inch Globe	24 00
No. 3, Engine, 3 inch Globe	36 00
No. 4, Engine, 4 inch Globe	54 00

All these Cups have the name "Drew" blown in the glass.

PRICE LIST FOR STRAIGHT PATTERN.

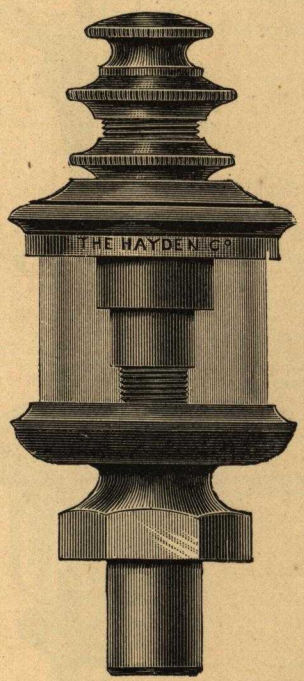
	Per Doz.
No. 0, Engine, 1¼ inch Glass	$12 00
No. 1, Engine, 1¼ inch Glass	21 00
No. 2, Engine, 1¾ inch Glass	36 00
No. 3, Engine, 2¼ inch Glass	48 00
No. 4, Locomotive, 2 inch Glass	54 00
No. 5, Extra Engine, 3 inch Glass	150 00

This No. 0 Cup is especially adapted to agricultural machinery and portable engines.

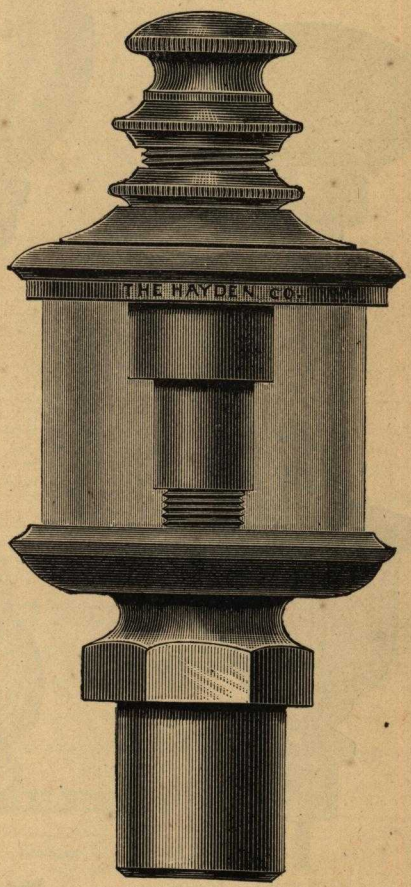
PATENT GLASS ENGINE OIL CUPS,

FULL SIZE.

No. 2, Fig. 542.



No. 4, Fig. 544.



GLASS OIL CUPS,

PATENTED.

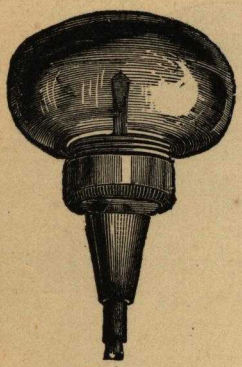
Figure	541	542	543	544	545	546	
Number	1	2	3	4	5	6	7
Diameter	1	1¼	1½	1¾	2	2¼	2½
Each	$0 90	1 15	1 30	1 60	2 00	2 50	3 00

EXTRA GLASSES FOR OIL CUPS.

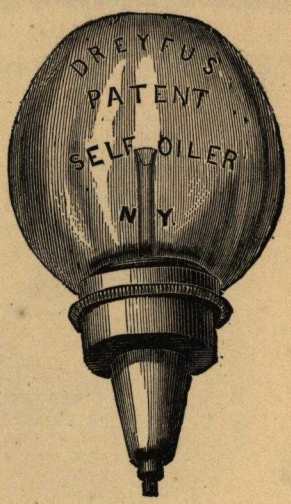
Diameter	1	1¼	1½	1¾	2	2¼	2½
Each	$0 20	0 20	0 25	0 25	0 30	0 40	0 50

DREYFUS' PATENT SELF-OILERS,

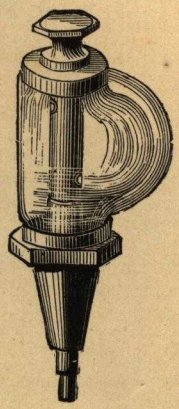
FOR SHAFTINGS AND ENGINES.



No. 9.

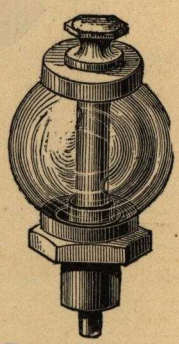


No. 10.

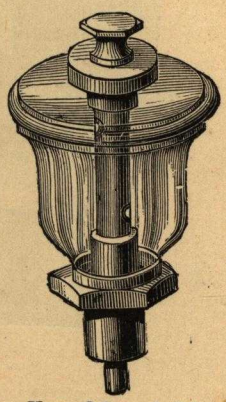


No. 13, W. B.

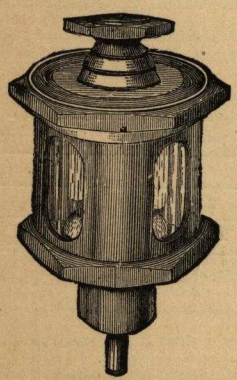
A to D.



Nos. 15 and 22.



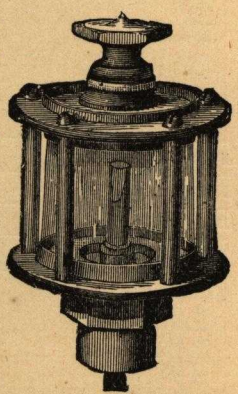
Nos. 24 and 26.



No. 42.

No. 20 to 100, Shell Cased.

They are composed of a transparent Glass Cup, mounted in brass, provided with a hollow tube, inside of which is placed a loose acting solid or hollow wire which acts as a feeder and regulator. The cup is fixed on the bearing, and the wire rests upon the Journal, thereby acting with the shaft in its motions. The wire is also so regulated inside the tube as to feed according to the demand only. There is no flow of oil whatever while the machinery is not in motion; they are as reliable in winter as in summer. Being a perfectly air tight vessel, the oil will never gum in them, as has been proved by many years constant use. They are constructed in a very neat and substantial manner. We spare no pains in making them as perfect as it is possible for them to be made, and guarantee them to give perfect and entire satisfaction.



No. 60.

No. 30 to 150, Skeleton.

DIRECTIONS FOR USING.—Fill the Cup full of oil, then screw the Cap down air tight. Place the tube in the oil hole in an upright position, or upon an angle of 45 degrees. Permit the Rod to rest upon the Journal, and have a perfectly free action. If you desire the oil to flow faster, reduce the size of the wire.

☞A saving of from 50 to 75 per cent. guaranteed.

PRICE LIST.

NUMBER.	Capacity.	Diameter.	Height.	Price, doz.
No. 000—For Cards, Looms, Lathes or for small Journals	¾ oz.	1⅛ in.	2⅛ in.	$7 50
No. 00—For Cards, Looms, Lathes or small Journals	1 oz.	2¼ in.	2⅛ in.	7 50
No. 0—For Card Cylinders, Strippers and Compact Connections	¾ oz.	1⅛ in.	2⅛ in.	7 50
No. 3—Ditto, to fill from top	¾ oz.	1⅛ in.	2⅛ in.	9 00
No. 9—For Shaftings, Pickers, Looms and Fans	1½ oz.	2½ in.	3¼ in.	9 00
No. 9—Wood Bottom, for Compact Shaftings or Connections	1½ oz.	1¾ in.	3¼ in.	9 00
No. 10—For Shaftings, Pickers, Looms and Fans	3½ oz.	2¼ in.	4¼ in.	9 00
No. 10—Wood Bottom, for Compact Shaftings or Connections	3 oz.	2 in.	4⅛ in.	9 00
No. 11—For Shaftings, or Connections where the Cups are screwed in	1½ oz.	2½ in.	3¼ in	12 00
No. 12—For same use as No. 11	3½ oz.	2¼ in.	4⅛ in.	12 00
No. 13—To fill from top	1½ oz.	2⅛ in.	3¼ in.	10 50
No. 13—Wood Bottom, ditto ditto	1½ oz.	1¾ in.	3⅛ in.	10 50
No. 14—Wood Bottom, ditto ditto	3½ oz.	2⅝ in.	4 in.	12 00
No. 15—For Engines or Connections, do do	3½ oz.	2⅝ in	4 in.	15 00
No. 16—For Small Connections, do do	⅜ oz.	1⅜ in.	2 in.	12 00
No. 18—For Upright Shafts	3½ oz.	2⅝ in.	4⅛ in.	24 00
No. 22—For Small Engines or Lathes	¾ oz.	1⅛ in.	2⅝ in.	12 00
No. 23—For Fast Running Lathes	⅛ oz.	1¼ in.	1⅝ in.	12 00
No. 24—For Engines	2¼ oz.	2¼ in.	3⅝ in.	15 00
No. 25—For Heavy Bearings or Pillow Blocks	8 oz.	3 in.	6 in.	27 00
No. 26—For Small Engines	¾ oz.	1¾ in.	2¾ in.	12 00

LOOSE PULLEY CUPS, WITH HOLLOW WIRE.

NUMBER.	Capacity.	Diameter.	Height.	Price, doz.
No. 22—	¾ oz.	1⅛ in.	2⅝ in.	$15 00
No. 23—	⅛ oz.	1¼ in.	1⅝ in.	15 00

ENGINE CUPS, SKELETON.

NUMBER.	Capacity.	Diameter.	Height.	Price, doz.
No. 30—	¼ oz.	1¾ in.	2½ in.	$ 30 00
No. 46—	1 oz.	2¼ in.	3½ in.	48 00
No. 48—	1¼ oz.	2⅜ in.	3¾ in.	48 00
No. 54—	1 oz.	2¼ in.	3⅜ in.	54 00
No. 60—	1¼ oz.	2½ in.	3¾ in.	60 00
No. 72—	2 oz.	2¾ in.	4⅛ in.	72 00
No. 76—	4½ oz.	3⅜ in.	5¼ in.	84 00
No. 80—	8 oz	3¾ in.	5½ in.	96 00

NUMBER.	Capacity.	Diamater.	Height.	Price, doz.
No. 90—	14 oz.	5 in.	7¼ in.	144 00
No. 150—	3 pints.	6¼ in.	8⅜ in.	240 00
No. 32—Iron M'ted.	8 oz.	4⅛ in.	6 in.	42 00
A,	⅜ oz.	1⅝ in.	2½ in	16 00
B, Small	¾ oz.	2 in.	3 in.	20 00
B,	1½ oz.	3⅛ in.	3½ in.	24 00
C,	3 oz.	2⅞ in.	4½ in.	32 00
D,	8 oz.	3½ in.	5¼ in.	40 00

Crank-Pin Cups for Upright Engines to order.

ENGINE CUPS, SHELL CASED.

Number.	Capacity.	Diameter.	Height.	Price, doz.
No. 20—	1-16 oz.	1 in.	1½ in.	$15 00
No. 21—	⅛ oz.	1⅜ in.	2¼ in.	24 00
No. 28—	¼ oz.	1½ in.	2½ in.	36 00
No. 36—	1 oz.	2 in.	3½ in.	48 00

Number.	Capacity.	Diameter.	Height.	Price, doz.
No. 42—	1¼ oz.	2 in.	4 in.	$48 00
No. 60—	2½ oz.	2⅜ in.	4¼ in.	60 00
No. 72—	4⅛ oz.	3 in.	4½ in.	72 00
No. 100—	1 qt.	5¾ in.	10 in.	240 00

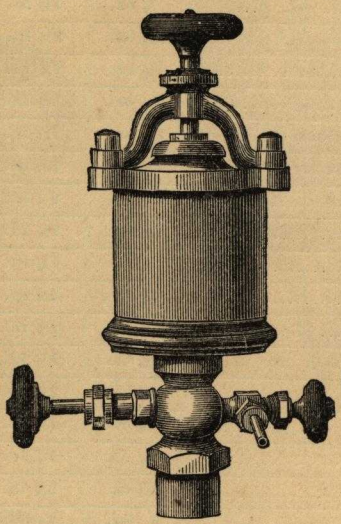
These Cups are unequaled for their reliability. They pay more than their cost every few weeks. No testimonials are printed, but ask any one who has them in use what they think of them.

NATHAN & DREYFUS' PATENT SELF-ACTING LUBRICATORS,

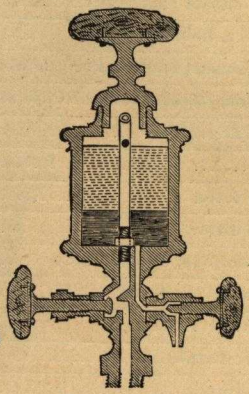
FOR STEAM CHEST AND CYLINDERS OF ALL KINDS AND SIZES.

(Patented October 27, 1863, and January 19, 1869.)

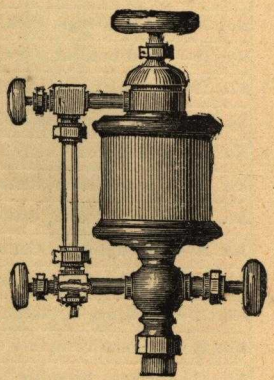
Plain, without Yoke.



With Yoke.



Interior View.



With Glass Indicator.

DIRECTIONS FOR USE.

Screw the Cup on top of the Steam Chest, or on the Steam Pipe. Fill it with Oil or melted Tallow up to the side hole of the inside Tube, then open the Valve about one-quarter, and it is ready for use.

EXPLANATION OF HOW THE LUBRICATOR OPERATES.

While the Engine is in motion, the steam passes up the Tube to the upper part of the Cup, where it condenses, and the water so produced, being heavier than the oil, sinks to the bottom and lifts an equal amount of the lubricant to the top, causing it to overflow through the side hole near the top of the Tube to the parts where the lubrication is required.

At the end of the day, or when the oil or tallow is exhausted, water, acids, and other impurities which remain, should be drawn off by the Waste Cock, and the Cup refilled with the lubricant.

PATENT SELF-ACTING LUBRICATORS,

WITH GLASS INDICATOR,

Which are very convenient, as may be seen in the last cut above, by showing the state of the oil in the Cup at any time.

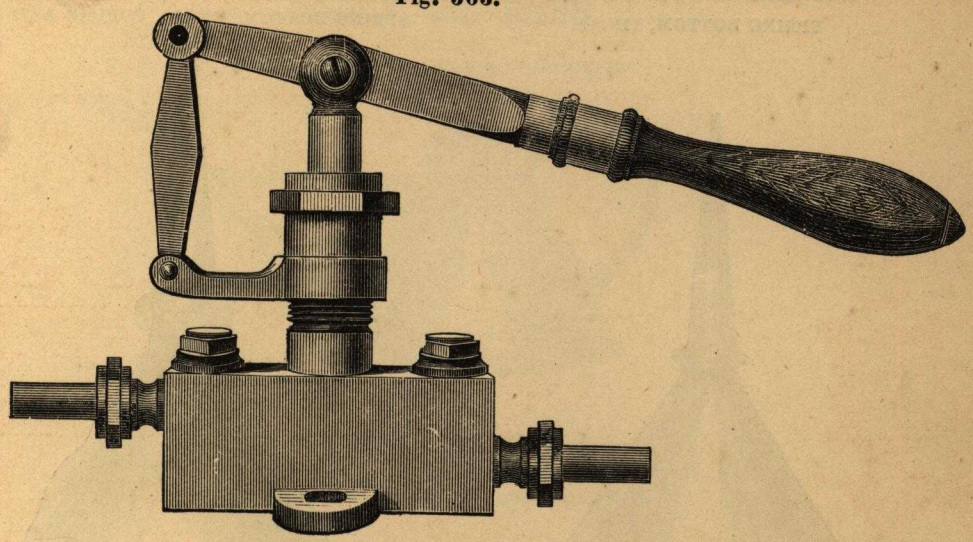
Attach these Lubricators to a nipple screwed into the Steam Chest, at an elevation of at least six inches from the latter, to prevent the oil from boiling. Keep the Steam Valve partly open, while the Lubricator is working, and the quantity of oil in the Cup will be constantly and accurately shown by the Indicator.

PRICE LIST OF PATENT LUBRICATORS.

Size, inches	1	1½	2	2½	3	4	5	6	7
Capacity, pints	1-16	⅛	1-5	⅓	½	1¼	3	5	7
Plain, each	$4 00	6 00	8 00	10 00	12 00	16 00			
With Yoke, Heavily Made, each					20 00	27 00	36 00		
With Glass Indicator, each			12 00	15 00	18 00	24 00			
Capacity of ditto in Pints			¼	½	¾	1½			

OIL PUMPS.

Fig. 563.



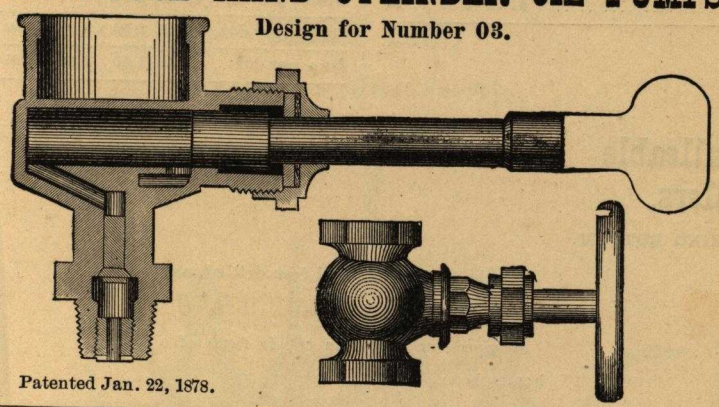
OIL PUMPS.

Fig. 563.

Number	1	2
Each	$14 00	16 00

FELTHOUSE HAND CYLINDER OIL PUMPS.

Design for Number 03.



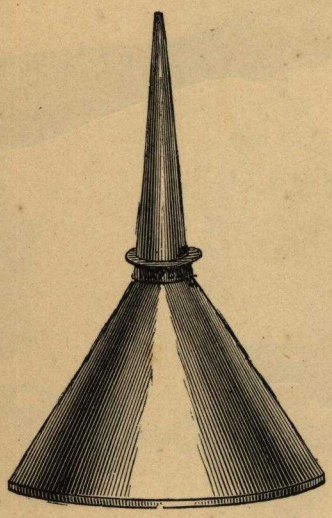
Patented Jan. 22, 1878.

DESCRIPTION.	Size.	With Screw Top.	With Strainer Top.	Extra Strainer Tops.
No. 1—Rough, with Bowl for Tallow; complete with Globe Valve	2 x 2	$3 50	$3 50	$0 20
No. 2—Finished, with Bowl for Tallow; complete with Globe Valve	2 x 2	5 00	5 00	0 20
No. 03—Finished, complete with Globe Valve	2 x 2	3 50	3 65	0 40
No. 3—Finished, complete with Globe Valve	2 x 2	3 50	3 65	0 40
No. 04—Finished, complete with Globe Valve	2¾ x 2¾	5 00	5 25	0 60
No. 4—Finished, complete with Globe Valve	3½ x 3½	7 50	7 80	0 75

Locomotive Oil Pump, 7x4½, with Strainer Top	$15 00
Jenkin's Discs for Check Valves	0 05
Couplings	0 50
Two-Outlet Cock	1 50

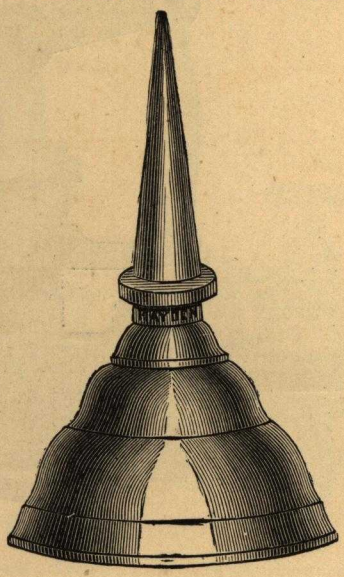
PLAIN OIL CANS,

SPRING BOTTOM, TIN.



FANCY OIL CANS,

SPRING BOTTOM, BRASS, COPPER AND ZINC.



PLAIN OIL CANS,

SPRING BOTTOM.

Numbers	1	2	3
Tin, per doz	$1 50	2 00	2 25

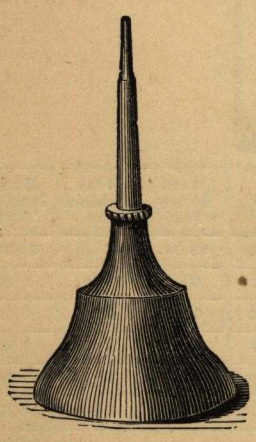
FANCY OIL CANS,

SPRING BOTTOM.

Numbers	0	1	2	3	4	5	6
Brass, per doz.	$2 25	2 50	3 00	3 50	4 50	5 75	7 00
Copper, per doz.	2 25	2 50	3 00	3 50	4 50	5 75	7 50
Zinc, per doz.	1 25	1 50	2 00	2 25	3 00	4 00	5 00

Patent Malleable Iron Oilers,

WITH STEEL SPRING BOTTOM.



PATENT MALLEABLE IRON OILERS,

WITH STEEL SPRING BOTTOM.

Price, per doz	$5 00

DRAPER OILERS.

Nozzle made from steel iron drilled, and case-hardened at the point.

Stamped wrought iron cup in form of a hemisphere.

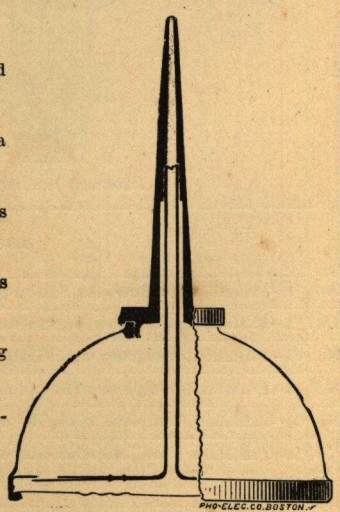
Spun brass bottom, corrugated, stiffens the centre, and throws spring outside.

False bottom, with hole for oil to pass between it and spring bottom.

Valve covers the hole when the spring bottom is pressed.

Gives a hydraulic pressure to the oil between the two bottoms.

Tube from false bottom to nozzle.

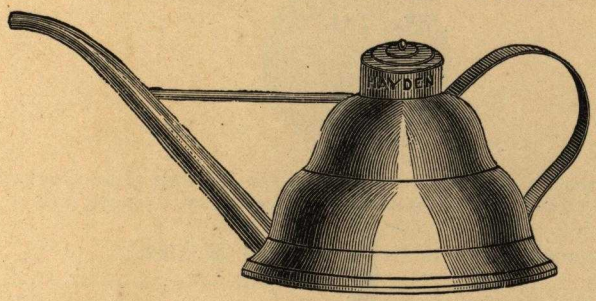


DRAPER OILERS.

3¼ inch diameter, per doz	$9 00

FANCY OIL CANS,

FOR ENGINEERS. BRASS AND COPPER.



FANCY OIL CANS,

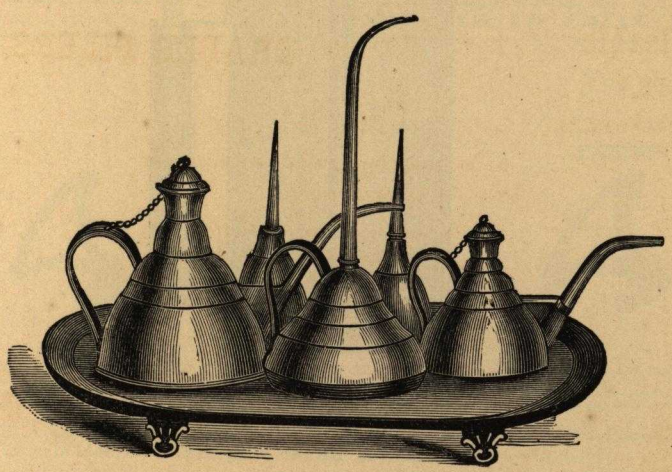
FOR ENGINEERS. BRASS AND COPPER.

Numbers	1	2	3	4
Brass, per doz	$23 00	24 00	25 00	26 00
Copper, per doz	23 00	24 00	25 00	26 00

No. 1, 1 Pint, Short Tube; No. 2, 1 Pint, Long Tube; No. 3, 1 Quart, Short Tube; No. 4, 1 Quart, Long Tube.

OILER SET,

BRASS AND NICKEL-PLATED.



OILER SET,

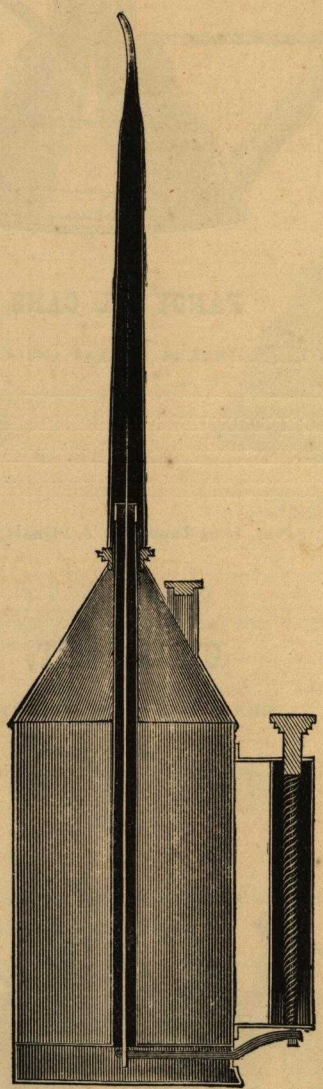
BRASS AND NICKEL-PLATED.

Brass, each	$16 00
Nickel-Plated, each	21 00

LOCOMOTIVE OIL CANS,

WITH VALVE, BRASS AND TIN

Fig. 784.



LOCOMOTIVE OIL CANS,

WITH VALVE, BRASS AND TIN.

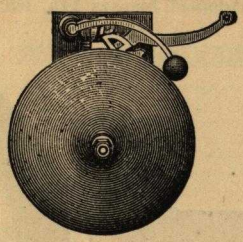
Fig. 784.

Numbers	1	2	3
Brass, with Valve, per doz	$48 00	60 00	72 00
Tin, with Valve, per doz	36 00	48 00	60 00
Brass, without Valve, per doz	36 00	48 00	60 00
Tin, without Valve, per doz	24 00	36 00	48 00

No. 1, one pint; No. 2, two pints; No. 3, three pints. With or without Valve.

SIGNAL OR GONG BELLS,

FOR SCHOOL-HOUSES, LOCOMOTIVES, HOTELS, STEAMBOATS, ETC



Our Signal Bell fixtures are all made from patterns of our own invention and construction after an experience of many years, and we can recommend them as the best in use for all purposes.

PRICE LIST (COMPLETE AS IN CUT).

4 inch, Polished, each	$2 45
5 inch, Polished, each	2 95
6 inch, Polished, each	3 70
7 inch, Polished, each	4 60
8 inch, Polished, each	5 60
9 inch, Polished, each	6 70
10 inch, Polished, each	7 90
11 inch, Polished, each	9 25

12 inch, Polished, each	$11 00
13 inch, Polished, each	12 90
14 inch, Polished, each	15 00
15 inch, Polished, each	18 50
16 inch, Polished, each	23 00
18 inch, Polished, each	28 00
20 inch, Polished, each	33 00

ENGINE BELLS,

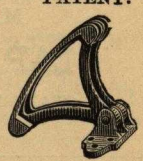
PLAIN, WITH SPRINGS.

PRICE LIST.

Diameter, in inches	3½	4	4½	5	5½	6	6½	7	8	9	10
Price	$1 75	2 00	2 25	2 50	3 25	3 75	4 00	5 50	7 00	8 50	10 00

ANGLES.

PATENT.



ANGLES.

Single Angles	$0 35
Single Angles, large	0 45
Single Angles, extra large (8 inch)	0 55

ANGLES,

PATENT.

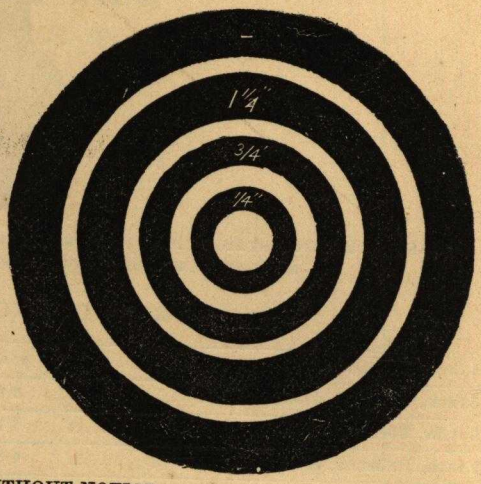
Double Angles	$0 55
Treble Angles	0 75

The manner in which the wire is attached to this Angle always prevents the danger of ringing two bells where only one is intended to be rung, as frequently happens where the ordinary Angle is used.

MANUFACTURERS' PRICE LIST

WROUGHT IRON WELDED GAS PIPE,

Adopted January 28th, 1880.



SUBJECT TO CHANGE WITHOUT NOTICE.

Size Inside Diameter.	Price per ft. Black.	Price per ft. Galvanized.	Weight per foot.
⅛ inch	$ 0 08	$	.24
¼ inch	0 08	0 11	.42
⅜ inch	0 09	0 12	.56
½ inch	0 11	0 15	.84
¾ inch	0 13½	0 19	1.12
1 inch	0 19	0 28	1.67
1¼ inch	0 27	0 40	2.25
1½ inch	0 33	0 47	2.69
2 inch	0 46	0 64	3.66
2½ inch	0 75	1 00	5.77
3 inch	0 95	1 30	7.54

Size Inside Diameter.	Price per ft. Black.	Price per ft. Galvanized.	Weight per foot.
3½ inch	$ 1 25	$ 1 70	9.05
4 inch	1 50	2 05	10.72
4½ inch	1 75	2 40	12.49
5 inch	2 25	3 00	14.56
6 inch	2 75	4 00	18.77
7 inch	3 75	....	23.41
8 inch	4 75	....	28.35
9 inch	6 50	....	34.07
10 inch	8 00	....	40.64
12 inch	12 00	....	....

Extra Heavy Wrought Iron Pipe, two times the price of Regular Pipe. Double Extra Heavy Wrought Iron Pipe, four times the price of Regular Pipe. In ordering Gas Pipe, always give internal diameter.

MANUFACTURERS' PRICE LIST

LAP WELDED BOILER TUBES,

OF STANDARD GAUGE, NOT OVER EIGHTEEN FEET LONG.

Adopted March 9th, 1881.

Size Outside Diameter.	Wire Gauge.	Price.	Weight per foot.
1 inch	15	$ 0 26	0.708
1¼ inch	15	0 26	0.9
1½ inch	14	0 25	1.250
1¾ inch	13	0 25	1.665
2 inch	13	0 25	1.981
2¼ inch	13	0 29	2.238
2½ inch	12	0 32	2.755
2¾ inch	12	0 35	3.045
3 inch	12	0 38	3.333
3¼ inch	11	0 44	3.958

Size Outside Diameter.	Wire Gauge.	Price.	Weight per foot.
3½ inch	11	$ 0 50	4.272
3¾ inch	11	0 56	4.590
4 inch	10	0 64	5.320
4½ inch	10	0 74	6.010
5 inch	9	0 90	7.226
6 inch	8	1 30	9.346
7 inch	8	1 70	12 435
8 inch	8	2 25	15.109
9 inch	7½	2 70	....
10 inch	6½	2 80	....

In ordering Boiler Flues, always give external diameter.

EXTRA WIRE GAUGE BOILER TUBES.

FOR ONE NUMBER.

2 inch	3 cents per foot extra.
2¼ inch	3¾ cents per foot extra.
2½ inch	3¾ cents per foot extra.

FOR TWO NUMBERS.

2 inch	6 cents per foot extra.
2¼ inch	6¾ cents per foot extra.
2½ inch	7½ cents per foot extra.

FOR THREE NUMBERS.

2 inch	9 cents per foot extra.
2¼ inch	10½ cents per foot extra.
2½ inch	11¼ cents per foot extra.

And so on for every size. Intermediate sizes, not on list, same price as next size above.

For Extra Wire Gauge "Boiler Tubes," away from standard, add 1½ cts. for each inch in diameter to the list price per foot for each additional number. To calculate price, take discount from list prices of Regular Tubes, and net charge for Extra Wire Gauge.

For price of Tubes over 18 feet long, add to the above price-list 1 cent per inch in diameter for Tubes one foot longer; 2 cents per inch in diameter for Tubes two feet longer; 3 cents per inch in diameter for Tubes three feet longer—and so on, for all sizes of Tubes up to, but not including, four inches in diameter.

Four inches up to, but not including, six inches in diameter, 2 cents per inch for the first foot, and so on additional. For Tubes six inches in diameter and up to eight inches in diameter, inclusive, 6 cents per foot for each extra foot on entire length. List figures on sizes above eight inch, cover prices of Tubes of any length. These prices of extra lengths cover Tubes either made in one piece, riveted or welded.

An extra charge of 5 cents per end is made for swaging or swelling Tubes under 2½ inches in diameter. A charge of 80 cents per hour will be made for cutting screws on Boiler Tubes.

No reduction in prices for Tubes lighter than standard.

SAFE ENDS.

Net Prices for Safe Ends, to 6 inches Long, Inclusive.

Over 6 inches long, the extra length will be charged for in same proportion.

Size, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6
Each End	$0 17	0 17	0 17	0 17	0 17	0 19	0 21	0 24	0 27	0 30	0 33	0 36	0 39	0 43	0 50	0 61

Net Prices for Repairing and Safe Ending Old Boiler Tubes.

Size, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6
Ea. B. Tube, both ends	$0 80	0 80	0 80	1 80	0 80	0 90	1 07	1 25	1 34	1 56	1 86	2 15	2 37	2 78	3 59	4 16

Net Prices for Safe Ends put on New Boiler Tubes.

Size, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6
Each End	$ 0 26	0 26	0 26	0 26	0 26	0 29	0 31	0 36	0 41	0 45	0 50	0 54	0 59	0 65	0 75	0 92

No additional charge will be made for Safe Ends of Extra Wire Gauge. All Boiler Tubes under twelve inches long to be called Safe Ends.

THE STANDARD PIPE CIPHER,

FOR ORDERING PIPE BY TELEGRAPH.

No. Feet.	PLAIN. Size.	GALVANIZED. Size.
100—Asia.	⅛—Allegheny.	¼—Amazon.
200—Belgium.	¼—Baltimore.	⅜—Bay.
300—Chili.	⅜—Camden.	½—Colorado.
400—Denmark.	½—Detroit.	¾—Danube.
500—Egypt.	¾—Erie.	1 —Elbe.
600—France.	1 —Fairmount.	1¼—Firth.
700—Germany.	1¼—Galena.	1½—Ganges.
800—Holland.	1½—Harrisburg.	2 —Hudson.
900—Ireland.	2 —Ithaca.	2½—Indus.
1000—Japan.	2½—Jamestown.	3 —Juniata.
2000—Kentucky.	3 —Kensington.	3½—Kanawha.
3000—Liberia.	3½—Lancaster.	4 —Lake.
4000—Maine.	4 —Macon.	4½—Miami.
5000—Nevada.	4½—Quincy.	5 —Nile.
6000—Ohio.	5 —Newark.	6 —Osage.
7000—Peru.	6 —Oneida.	7 —Po.
8000—Russia.	7 —Paris.	8 —Rhine.
9000—Spain.	8 —Reading.	9 —Seine.
10000—Texas.	9 —Salem.	10 —Tweed.
	10 —Troy.	

QUERIES——AND——ORDERS.

AVA—At what price can you furnish.....?

BARO—At what price, and how soon can you furnish.....?

CONGO—Have you in stock and can you furnish .....?

DON—What is the lowest contract rate of freight you can obtain on.....?

EBRO—What is the freight per 100 lbs. per Express on.....?

FORTH—Have you shipped order of.....inst.?

GONDAR—When can you ship.....?

ATLANTIC—Ship immediately by express.

ADRIATIC—Ship immediately by steamer.

BISCAY—Ship immediately by rail (freight).

BALTIC—Suspend shipment of order of.....inst.

CARNATIC—Suspend work on order of.....inst., until further instructions.

CASPIAN—You can vary the lengths, but send not less than.....

PACIFIC—You can vary on the thickness, but not more than.....

CARIBBEAN—Send tracer immediately for shipment of.....

ANSWERS TO QUERIES AND ORDERS.

ALFRED—We can furnish you at (price).....

BERNARD—We have in stock, and can furnish at once, at (price).....

CONRAD—We have none in stock, but will make, and ship by.....

DANIEL—Freight by Express per 100 lbs. is .....

ERNEST—Freight by rail (freight) in car loads per 100 lbs. is.....

FREDERICK—Freight by rail (freight) in less than car loads per 100 lbs. is.....

GUY—We shipped your order on.....

ARROW—We will ship you immediately order .....

BOW—We will ship your order on.....

CANNON—We have suspended shipment of your order of.....

DIRK—We have suspended work on your order of.....

GUN—We can (or will) vary the lengths, and will send.....

SWORD—We can (or will) vary the thickness, and will send.....

CIPHER FOR ORDERING BOILER FLUES BY TELEGRAPH.

NUMBER OF BOILER TUBES REQUIRED.

1—Mab.
2—Mac.
3—Mad.
4—Mag.
5—Mail.
6—Maid.
7—Main.
8—Make.
9—Man.
10—Manks.
11—Manor.
12—Many.
13—Mar.
14—March.
15—Mars.
16—Marks.
17—Marl.
18—Marsh.
19—Mart.
20—Mask.
21—Mast.
22—Mat.
23—Match.
24—Math.
25—Mate.
26—Maul.
27—May.
28—Maze.
29—Mead.
30—Meal.
31—Mean.
32—Meat.
33—Melt.
34—Mend.
35—Mense.
36—Ment.
37—Mere.
38—Merl.
39—Mesh.
40—Met.
41—Mew.
42—Mice.
43—Mid.
44—Midge.
45—Midst.
46—Might.
47—Mild.
48—Mile.
49—Milk.
50—Mince.
51—Mingle.
52—Mind.
53—Minor.
54—Mint.
55—Mire.
56—Mirk.
57—Mirth.
58—Miss.
59—Mite.
60—Mix.
61—Mizzen.
62—Moat.
63—Mob.
64—Mock.
65—Mode.
66—Moil.
67—Moist.
68—Mold.
69—Mole.
70—Monde.
71—Monk.
72—Mont.
73—Mop.
74—Moral.
75—More.
76—Morn.
77—Morris.
78—Morse.
79—Most.
80—Mot.
81—Moth.
82—Mould.
83—Mount.
84—Mouth.
85—Move.
86—Mow.
87—Much.
88—Mud.
89—Muff.
90—Mufti.
91—Mulct.
92—Mull.
93—Mump.
94—Mural.
95—Muse.
96—Mush.
97—Musk.
98—Mute.
99—Mystic.
100—Myrtle.
150—Nab.
200—Nice.
250—Nut.
300—Obey.
350—Old.
400—Pad.
450—Pin.
500—Quad.
550—Quote.
600—Rapid.
650—Row.
700—Sad.
750—Scot.
800—Tap.
850—Try.
900—Ugly.
950—Urn.
1000—Vast.

DIAMETER OF BOILER TUBES REQUIRED.

O. D. Inch.

1 —Albatross.
1¼—Bittern.
1½—Condor.
1¾—Duck.
2 —Eagle.
2¼—Finch.
2½—Goose.
2¾—Hawk.
3 —Ibis.
3¼—Jay.
3½—Kite.
3¾—Lark.
4 —Macaw.
4½—Nightingale.
5 —Owl.
6 —Plover.
7 —Parrot.
8—Quail.
9—Robin.
10—Raven.
11—Starling.
12—Teal.
13—Vulture.
14—Widgeon.
15—Wren.

LENGTH IN FEET OF BOILER TUBES REQUIRED.

Feet.

1—Ape.
2—Badger.
3—Cat.
4—Dog.
5—Elk.
6—Fox.
7—Goat.
8—Horse.
9—Ibex.
10—Jackal.
11—Kangaroo.
12—Lion.
13—Mule.
14—Nylgau.
15—Otter.
16—Panther.
17—Quagga.
18—Ram.
19—Sheep.
20—Tiger.
21—Unicorn.
22—Vampire.
23—Wolf.
24—Zebra.

BOILER FLUE CIPHER—Continued.

LENGTH IN INCHES OF BOILER TUBES REQUIRED.

Inch.	Inch.	Inch.
1—Alewife.	5—Eel.	9—Lobster.
2—Bass.	6—Flounder.	10—Mullet.
3—Cod.	7—Grampus.	11—Nautilus.
4—Dolphin.	8—Hake.	12—Oyster.

LENGTH IN FRACTIONS OF AN INCH REQUIRED.

Inch.	Inch.	Inch.
$\frac{1}{8}$—Dew.	$\frac{3}{8}$—Ice.	$\frac{5}{8}$—Snow.
$\frac{1}{4}$—Hail.	$\frac{1}{2}$—Rain.	$\frac{3}{4}$—Sleet.
		$\frac{7}{8}$—Water.

WIRE GAUGE.

TO BE USED ONLY WHEN THE REQUIRED THICKNESS DIFFERS FROM STANDARD.

No.	No.	No.
1—Apollo.	7—Graces.	13—Neptune.
2—Bacchus.	8—Hebe.	14—Orpheus.
3—Cupid.	9—Iris.	3-16—Pan.
4—Diana.	10—Jupiter.	$\frac{1}{4}$—Saturn.
5—Erebus.	11—Luna.	$\frac{3}{8}$—Uranus.
6—Flora.	12—Mercury.	

EXAMPLES.

TELEGRAPHIC MESSAGE FOR BOILER TUBES.

"At what price, and how soon, can you furnish two hundred and thirty-eight Boiler Tubes, three and three-quarter inch diameter, seventeen feet seven and seven-eighths inches long, number ten gauge?"

Transposed into the within Telegraphic Cipher, it will read:

BARO, NICE, MERL, LARK, QUAGGA, GRAMPUS, WATER, JUPITER.

TELEGRAPHIC MESSAGE FOR PIPE.

"At what price can you furnish, and when can you ship, ten thousand feet, two inch, five thousand feet, one and one-quarter inch, three thousand feet, three-quarter inch plain pipe---five hundred feet, one inch, galvanized?"

Transposed into the within Telegraphic Cipher, it will read:

AVA, GONDAR, TEXAS, ITHACA, NEVADA, GALENA, LIBERIA, ERIE, EGYPT, ELBE.

WROUGHT IRON ARTESIAN, SALT AND OIL WELL TUBING,

WITH SCREW AND SOCKET, OR WITH FLUSH JOINTS, FINISHED SMOOTH INSIDE.

Nominal Inside Diameter, inches.	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price, per foot.....	$0 16	0 20	0 27	0 34	0 45	0 57	0 72	0 86	1 05	1 40	1 90	2 25	3 00	4 00

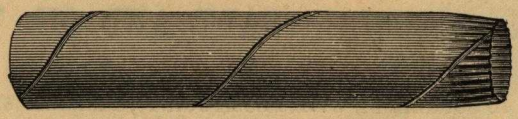
ARTESIAN, SALT AND OIL WELL CASING,

WITH SCREW AND SOCKET, OR WITH INSERTED JOINT, FINISHED SMOOTH INSIDE.

Diameter Nominal Inside.	Diameter Actual Outside.	Pounds, Weight Per Foot.	Price, Per Foot.
1½ inches.	1¾ inches.	1.665	$0 20
2 inches.	2¼ inches	2.238	0 23
2¼ inches.	2½ inches.	2.755	0 25
2½ inches.	2¾ inches	3.045	0 29
2¾ inches.	3 inches.	3.333	0 31
3 inches.	3¼ inches.	3.958	0 36
3¼ inches.	3½ inches.	4.272	0 40
3½ inches.	3¾ inches.	4.590	0 48
3¾ inches.	4 inches.	5.320	0 54
4 inches.	4¼ inches.	5.500	0 58
4¼ inches.	4½ inches.	6.010	0 63
4½ inches.	4¾ inches.	6.495	0 70
4¾ inches.	5 inches.	7.226	0 76
5 inches.	5¼ inches.	7.667	0 86
5 3-16 inches.	5½ inches.	8.083	1 00
5⅝ inches.	6 inches.	9.346	1 10
6¼ inches.	6⅝ inches.	10.064	1 35
6⅝ inches.	7 inches.	12.435	1 62
7⅝ inches.	8 inches.	15.109	2 00
8¼ inches.	8⅝ inches.	16.155	2 25

SPIRAL LOCK SEAMED PIPE,

MANUFACTURED OF LIGHT GAUGES GALVANIZED IRON, SUITABLE FOR HOUSE, LEADER AND VENTILATING PIPE, AIR BLOWER PIPE, ETC.



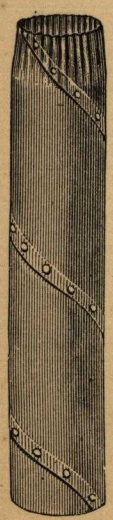
PRICE PER LINEAL FOOT.

Inside Diameter.	Galvanized Iron.	Nominal Weight Per Foot.	Thickness W. G.
1 inch	$0 08	¼ pound.	30
1¼ inch	0 12	⅓ pound.	30
2 inch	0 14	⅝ pound.	28
2½ inch	0 17	¾ pound.	28
3 inch	0 19	⅞ pound.	27
3½ inch	0 21	1 pound.	27
4 inch	0 25	1¼ pound.	26
4½ inch	0 28	1⅜ pound.	26
5 inch	0 30	1½ pound.	26
5½ inch	0 33	1⅝ pound.	26
6 inch	0 38	1¾ pound.	25
7 inch	0 42	2 pound.	25
8 inch	0 50	2⅛ pound.	25
9 inch	0 60	2¾ pound.	25
10 inch	0 70	3⅛ pound.	24
11 inch	0 80	3½ pound.	24
12 inch	0 90	4 pound.	24

Manufactured in lengths of 2, 3, 5 and 10 feet each. Spiral Pipe heavier than 24 W. G., see pages 219 and 220, Spiral Riveted Pipe. Oval and Square Pipe, special prices.

SPIRAL RIVETED PIPE,

MANUFACTURED OF LIGHT GAUGES BLACK AND GALVANIZED IRON, SUITABLE FOR BLOWER, AIR AND SMOKE PIPE, LEADERS, VENTILATORS, ETC.

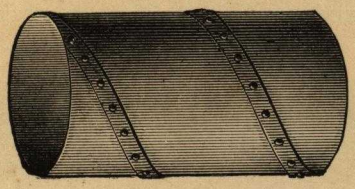


Inside Diameter.	No. W. G. Thickness.	Black.		Galvanized.	
		Nominal Weight per 100 feet.	Price per foot.	Nominal Weight per 100 feet.	Price. per foot.
3 inch	No. 25	85 pounds.	$0 13	110 pounds.	$0 24
4 inch	No. 25	105 pounds.	0 16	126 pounds.	0 30
5 inch	No. 25	120 pounds.	0 19	144 pounds.	0 35
6 inch	No. 23	155 pounds.	0 24	210 pounds.	0 45
7 inch	No. 23	170 pounds.	0 26	240 pounds.	0 50
8 inch	No. 23	215 pounds.	0 30	290 pounds.	0 60
9 inch	No. 23	260 pounds.	0 36	310 pounds.	0 65
10 inch	No. 23	290 pounds.	0 40	350 pounds.	0 72
11 inch	No. 23	320 pounds.	0 45	400 pounds.	0 80
12 inch	No. 23	350 pounds.	0 49	430 pounds.	0 90

Riveted Pipe of heavier iron and larger diameter, sold by weight. See pages 219 and 220.

SPIRAL RIVETED PIPE AND FITTINGS,

MANUFACTURED OF HEAVY GAUGES BLACK AND GALVANIZED SHEET IRON, SUITABLE FOR WATER, BLOWER, AIR, VENTILATOR PIPE AND SMOKE STACKS, ETC.



PRICES PER POUND.

BLACK.	Cents.	GALVANIZED.	Cents.
No. 12 to 14, W. G., per pound		No. 12 to 14, W. G., per pound	
No. 15 to 17, W. G., per pound		No. 15 to 17, W. G., per pound	
No. 18 to 20, W. G., per pound		No. 18 to 20, W. G., per pound	
No. 21 to 24, W. G., per pound		No. 21 to 24, W. G., per pound	

Made in any desired length not exceeding 25 feet.

PRICE LIST OF FITTINGS FOR ABOVE PIPE, PER POUND.

BLACK.	Cents.	GALVANIZED.	Cents.
No. 12 to 14, W. G., per pound		No. 12 to 14, W. G., per pound	
No. 15 to 17, W. G., per pound		No. 15 to 17, W. G., per pound	
No. 18 to 20, W. G., per pound		No. 18 to 20, W. G., per pound	
No. 21 to 24, W. G., per pound		No. 21 to 24, W. G., per pound	

WROUGHT IRON LUGS FOR SLIP JOINTS.

Black, each	$0 12
Galvanized, each	0 15

Pipe and Fittings Dipped in Coal Tar and Asphalt at 300° Temperature, extra.

No. 16, W. G., and heavier, extra net, per lb	
No. 17, W. G., and lighter, extra net, per lb	

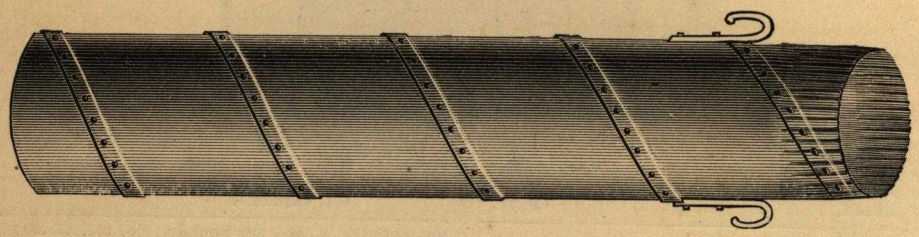
NOMINAL WEIGHT PER 100 FEET OF BLACK AND GALVANIZED RIVETED PIPE.

WIRE GAUGE.	24		22		20		18		16		14		12		10	
Inside Diameter, inches	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal	Blk.	Gal.	Blk.	Gal.
3	93	132	120	145	140	195										
4	125	145	140	170	195	230	240	270								
5	150	170	175	214	230	264	300	335								
6			200	235	265	310	350	390	475	525						
7			235	290	315	360	395	450	500	600						
8			270	330	350	410	460	500	630	670						
9			310	370	395	465	520	575	740	765	900	945				
10			340	410	440	510	580	640	785	825	985	1035				
11			366	450	495	570	630	700	860	925	1080	1130				
12			424	520	570	670	735	810	1000	1060	1260	1325	1635	1720		
13			465	565	620	725	800	885	1085	1160	1375	1445	1785	1875	2200	2300
14			510	617	690	780	880	970	1190	1265	1500	1575	1960	2000	2415	2500
15					745	830	950	1050	1285	1365	1615	1700	2115	2220	2610	2700
16					795	880	1015	1135	1365	1450	1725	1815	2260	2375	2790	2875
18					900	975	1130	1250	1575	1640	1950	2025	2575	2640	3150	3225
20					970	1080	1245	1375	1675	1785	2115	2220	2760	2900	3400	3480
22							1360	1500	1835	1950	2320	2485	3025	3175	3725	3825
24							1480	1635	2000	2125	2520	2650	3300	3465	4025	4150
26							1600	1775	2160	2300	2720	2860	3560	3740	4375	4500
28									2350	2500	2950	3100	3860	4060	4750	4875
30									2520	2700	3170	3330	4150	4360	5100	5225

NOMINAL WEIGHT OF FITTINGS.—Elbows, 2½ times weight of one foot pipe; Tees, 3 times weight of one foot pipe; Crosses, 4 times weight of one foot pipe. Long sweep elbows, for hydraulic pipe lines, should be on the radius of a circle, from three to five times the diameter of the pipe; the approximate weight of such is easily calculated from the above. Riveted Pipe of lighter gauges than above, see page 218.

SPIRAL SEAM RIVETED HYDRAULIC PIPE,

FOR HYDRAULIC MINING AND ENGINEERING, AND CITY WATER WORKS.



Furnished with Flanges or Slip Joint and Hooks for wiring, or sleeve and nipple connections; in the latter, provision is made for tapping service pipes to the water mains. Make of Galvanized or Black Sheet Iron, of all gauges and diameters, or dipped in Coal Tar and Asphalt at a temperature of 300°.

In pipe or tubes made by our process the seam takes a spiral form—uniform interior diameter being secured by an offset on the outside edge of the strip equal to the thickness of the sheet or plate used. Seams thus constructed are superior in strength to the body of the iron, and add greatly to the rigidity of the pipe, which also has the advantage of the tensile, instead of the transverse strength of the sheet, for which reasons a tube made of ¼ inch iron, with a spiral seam, would resist as great a bursting strain as one made of scant ⅜ inch iron with a straight seam, thus effecting a saving of over one-third in the material employed. Recognized engineering authorities give the strength of a longitudinally riveted seam to be only about 55 per cent. of the strength of the iron of which it is made. Recent tests of spiral seam pipe gave, upon a Belfield gauge, the following extraordinary bursting pressures:

12 inch Pipe of No. 16 Gauge Iron .....450 pounds per square inch.
8 inch Pipe of No. 18 Gauge Iron.....490 pounds per square inch.
6 inch Pipe of No. 18 Gauge Iron.....650 pounds per square inch.
4 inch Pipe of No. 20 Gauge Iron.....750 pounds per square inch.
3 inch Pipe of No. 20 Gauge Iron.....900 pounds per square inch.

Pipe to stand extra pressure to order, and tested to liberal margin of safety.

ECONOMY IN TRANSPORTATION.

The saving in the cost of transporting Spiral Steam Pressure Pipe over wrought iron tubing is manifest by a glance at the following comparison of weights per running foot:

Size, inches	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Wrought Iron Tubing weighs, per foot, about	7⅛	10¾	14½	18¾	23	28	34½	40⅝		54⅝						
Spiral Seamed Pipe standing above pressures weighs, per foot, about	1¼	2	2¼	3	4	4¾	5¼	6	6½	10	12	15	16½	17½	20	22
Difference in Weight in favor of Spiral Pipe, per foot	6¼	8¾	12¼	15¾	19	23¼	29¼	34⅝		44⅝						

BLACK SPIRAL SEAM RIVETED HYDRAULIC PIPE,

WITH FLANGED CONNECTIONS.

Ascertain the weight per foot of Pipe of the required gauge and diameter from page 219, and to the total weight of one length of Pipe add the weight of one pair Flanges of same diameter, see page 222; the price per pound of Pipe thus completed will be found on page 219, opposite the gauge of which the Pipe is made.

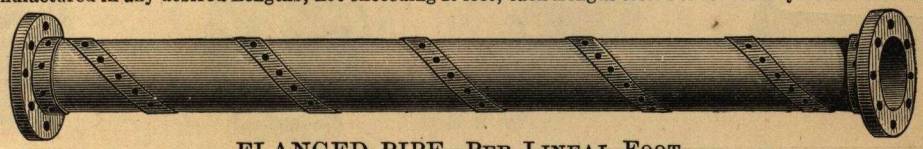
Follow the same rule for Fittings of Riveted Sheet Iron, the price per pound for the gauge of iron used being found under the head of Fittings. The price of Cast Iron Flanged Fittings, and Bolts and Caskets, will be found on page 222.

For price of dipping in Coal Tar and Asphalt, see page 219.

HEAVY GALVANIZED WROUGHT IRON SPIRAL RIVETED PRESSURE PIPE,

SUITABLE FOR USE AS WATER PIPE, EXHAUST STEAM AND BLOW-OFF PIPE, PUMP SUCTIONS, AIR COMPRESSOR AND GENERAL USE WHERE SUBJECTED TO PRESSURE.

Manufactured in any desired Lengths, not exceeding 20 feet, each Length tested to 150 lbs. Hydraulic Pressure.



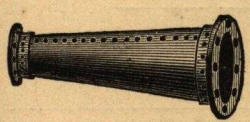
FLANGED PIPE—PER LINEAL FOOT.

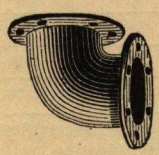
INSIDE DIAMETER.	Price, Per Foot.	Thickness W. G.	Nominal Weight Per Foot.
3 inch	$0 51	No. 18	2½ pounds.
4 inch	0 71	No. 18	4 pounds.
5 inch	1 00	No. 18	5 pounds.
6 inch	1 24	No. 16	6 pounds.
7 inch	1 44	No. 16	7 pounds.
8 inch	1 72	No. 16	8 pounds.
9 inch	2 00	No. 16	9 pounds.
10 inch	2 62	No. 14	12 pounds.
11 inch	2 86	No. 14	13 pounds.
12 inch	3 18	No. 14	14 pounds.
13 inch	3 58	No. 14	16 pounds.
14 inch	3 98	No. 14	18 pounds.
15 inch	4 37	No. 14	20 pounds.
16 inch	5 16	No, 12	24 pounds.
18 inch	6 36	No 12	30 pounds.
20 inch	7 95	No. 12	35 pounds.

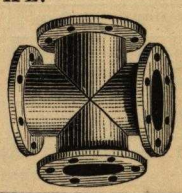
Manufactured in lengths of 2 feet to 20 feet. Pipe and Fittings got out to specifications or drawings without extra charge, excepting where the lengths required are all 5 feet and under, for which extra charge is made.

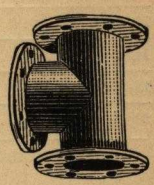
GALVANIZED, CAST AND WROUGHT IRON FITTINGS,

FOR SPIRAL FLANGE PIPE.







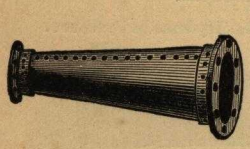
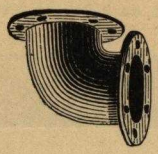
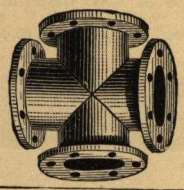
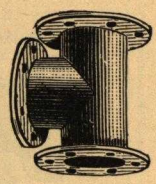


Inside Diameter of Pipe.	PRICE, EACH. Elbows.	Tees.	Crosses.	Reducers.	Extra Flanges.	Disc or Blind Flange.	Bolts.	Composition Gaskets.	Pure Gum or Sheet Lead Gaskets.
3 inches	$1 30	$2 85	$4 90	*$2 85	$0 34	$0 40	$0 05	$0 12	SPECIAL PRICES WHEN ORDERED.
4 inches	1 90	3 85	6 25	* 3 58	0 49	0 60	0 05	0 16	
5 inches	2 53	4 40	8 60	* 4 30	0 68	0 85	0 05	0 18	
6 inches	3 51	5 05	12 15	* 5 75	0 86	1 10	0 07	0 20	
7 inches	5 95	8 70	13 60	* 6 44	1 00	1 50	0 07	0 24	
8 inches	7 30	10 70	16 45	* 7 50	1 10	2 00	0 07	0 31	
9 inches	8 98	13 20	17 87	* 8 60	1 47	2 50	0 07	0 37	
10 inches	11 63	15 65	21 10	*11 80	1 75	2 83	0 07	0 48	
11 inches	14 70	20 38	26 10	*13 58	1 90	3 28	0 07	0 52	
12 inches	16 37	21 50	27 88	*15 00	2 20	4 48	0 07	0 56	
13 inches	18 00	24 00	31 50	*16 50	2 40	4 84	0 07	0 62	
14 inches	*22 16	*31 50	*39 00	*18 25	2 86	5 38	0 08	0 68	
15 inches	*27 88	*40 00	*45 75	*22 50	3 46	5 92	0 08	0 75	
16 inches	*30 00	*45 00	*53 00	*25 75	4 63	6 70	0 08	0 90	
18 inches	*32 89	*50 00	*58 63	*30 38	4 84	8 00	0 08	1 07	
20 inches	*38 60	*57 00	*67 50	*39 00	5 70	10 00	0 08	1 20	

*Marked thus are Riveted Sheet Iron, all others are Cast Iron. Larger Fittings and any kind of Connections furnished to order or specification.

BLACK CAST AND WROUGHT IRON FITTINGS,

FOR SPIRAL FLANGE PIPE.

Inside Diameter of Pipe.	PRICE, EACH.								
	Elbows.	Tees.	Crosses.	Reducers.	Extra Flanges.	Disc, or Blind Flange.	Bolts.	Composition Gaskets.	Pure Gum, or Sheet Lead Gaskets.
3 inches.....	$0 93	$1 94	$3 93	*$1 93	$0 24	$0 28	$0 04	$0 12	SPECIAL PRICES WHEN ORDERED.
4 inches.....	1 32	2 55	4 93	* 2 36	0 31	0 41	0 04	0 16	
5 inches.....	1 69	2 90	6 00	* 3 00	0 46	0 52	0 04	0 18	
6 inches.....	2 35	3 27	8 15	* 3 86	0 52	0 78	0 05¼	0 20	
7 inches.....	4 40	6 50	10 30	* 4 72	0 65	1 00	0 05¼	0 24	
8 inches.....	5 30	7 78	11 87	* 5 58	0 73	1 16	0 05¼	0 31	
9 inches.....	6 35	9 35	14 30	* 7 00	1 00	1 43	0 05¼	0 37	
10 inches.....	8 00	10 92	17 52	*10 00	1 13	1 65	0 05¼	0 48	
11 inches.....	10 00	14 00	19 30	*11 22	1 31	2 00	0 05¼	0 52	
12 inches.....	11 28	14 82	21 10	*12 50	1 43	2 35	0 05¼	0 56	
13 inches.....	12 15	16 47	24 00	*14 00	1 60	3 00	0 05¼	0 62	
14 inches.....	*13 95	*18 60	*26 50	*15 40	1 76	3 50	0 06	0 68	
15 inches.....	*15 00	*23 00	*32 50	*17 16	2 32	3 80	0 06	0 75	
16 inches.....	*17 50	*26 45	*34 35	*19 30	2 85	4 28	0 06	0 90	
18 inches.....	*19 30	*31 45	*40 40	*23 60	3 13	5 80	0 06	1 07	
20 inches.....	*21 45	*35 00	*45 40	*26 10	3 62	7 50	0 06	1 20	

*Marked thus are Riveted Sheet Iron, all others are Cast Iron. Larger Fittings and any kind of Connections furnished to order or specification.

CAST AND WROUGHT IRON FITTINGS,

FOR SPIRAL FLANGE PIPE.

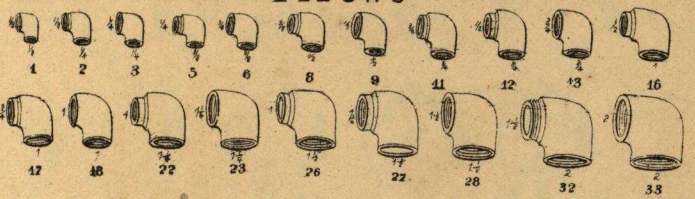
TABLE NOMINAL WEIGHTS AND DIMENSIONS.

DIMENSIONS, IN INCHES.								WEIGHTS, EACH, IN POUNDS.						
Size Inside Diameter.	Outside Diam. Flanges.	No. Bolt Holes.	Diameter Bolt Holes.	Diam. Cir. on which Bolt Holes are drilled.	Size of Bolts.	Space filled from Face to Centres. Elbows, Tees and Crosses.	Reducers, Length, each.	Elbows.	Tees.	Crosses.	Reducers.	Flanges.	Disc, or Blind Flanges.	Composition Gaskets.
3 inch	6	4	⅝	4¾	⅜x1½	3½	23	6	16	25	‡ 9	3	3¼	⅛
4 "	7	4	⅝	5 15-16	7-16x1½	4¼	23	10½	23½	31	‡ 11	4	5	⅛
5 "	8	4	⅝	6 15-16	7-16x1½	5	23	15	27	37	‡ 14	5	6	⅛
6 "	8⅞	8	⅝	7⅞	½x1¾	6	23	21	30	40	‡ 18	6	9	⅛
7 "	10	8	⅝	9	½x1¾	7	22	26½	40	55	‡ 22	8	12	⅛
8 "	11	8	⅝	10	½x2	8	22	36	53	70	‡ 26	8½	14	¼
9 "	13	8	⅝	11¼	½x2	9	22	47	69½	84	‡ 31	12	18	¼
10 "	14	8	⅝	12½	½x2	10	33	65	85	113	‡ 50	14	19	1
11 "	15	12	⅝	13⅝	½x2	11	33	85	115	155	‡ 56	15	25	1⅛
12 "	16	12	⅝	14¼	½x2	12	33	98	120	160	‡ 62	16	30	1¼
13 "	17	12	⅝	15¼	½x2	13	33	105	135	180	‡ 70	18	35	1⅜
14 "	17⅞	12	⅝	16¼	½x2½	14	32	72	‡108	‡131	‡ 77	20	42	1⅜
15 "	19	12	⅝	17 7-16	½x2½	15	32	‡ 87	‡132	‡162	‡ 86	24	46	1¾
16 "	21 3-16	12	⅞	19¼	½x2½	16	32	‡103	‡157	‡193	‡108	34	52	2¼
18 "	23¼	16	11-16	21¼	½x2½	18	32	‡111	‡168	‡217	‡126	39	70	2¾
20 "	25½	16	11-16	23⅝	½x2½	20	32	‡126	‡200	‡244	‡139	43	90	3½

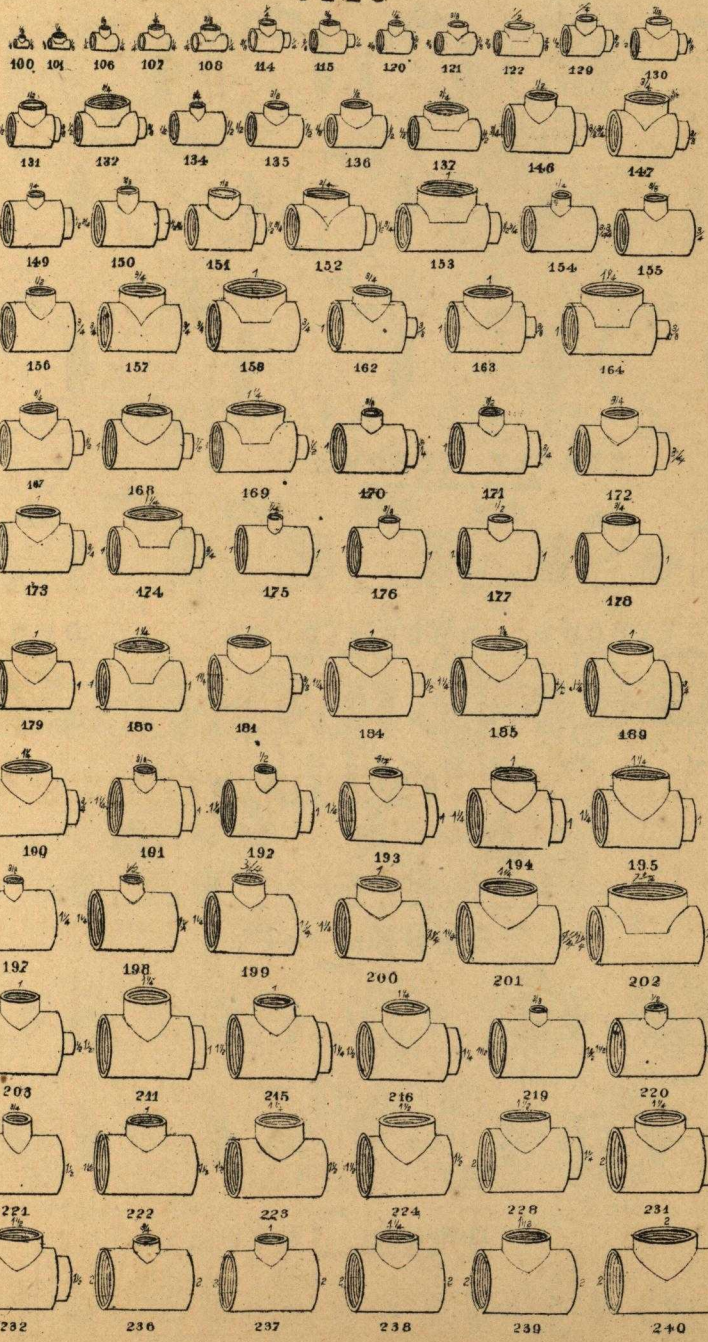
Fittings of any design to order. All Fittings cast iron, except those marked thus ‡, which are wrought iron, with cast iron Flanges.

MALLEABLE IRON GAS FITTINGS.

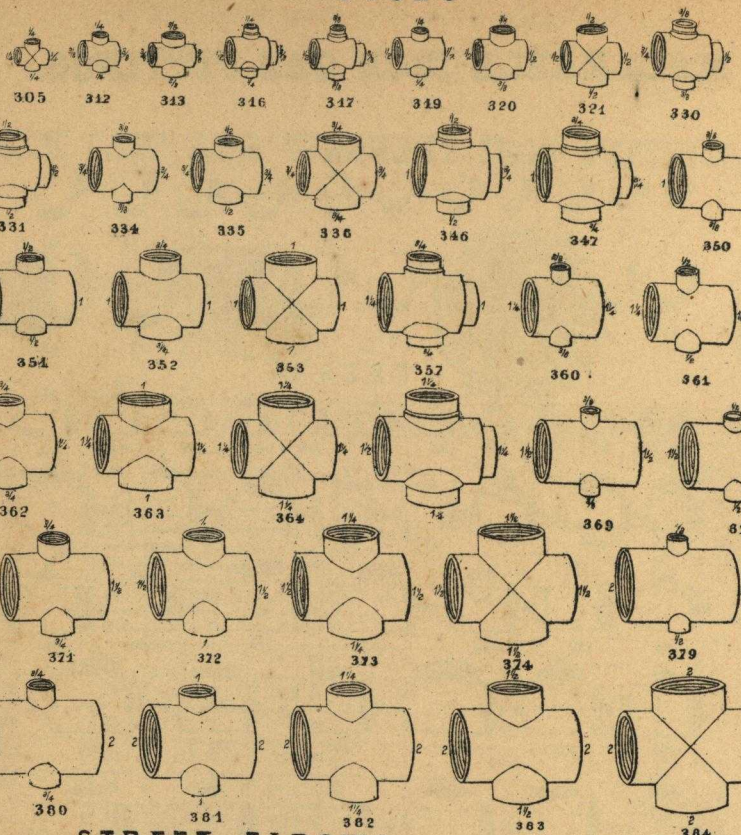
ELBOWS



TEES

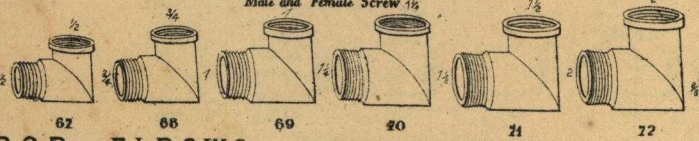


CROSSES



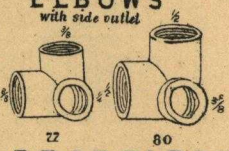
STREET ELBOWS

Male and Female Screw



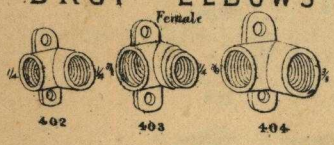
ELBOWS

with side outlet



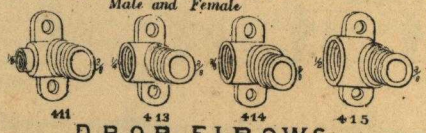
DROP ELBOWS

Female



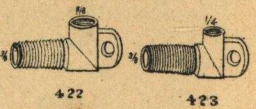
DROP ELBOWS

Male and Female



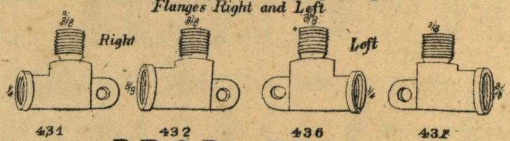
DROP ELBOWS

with long outlet piece



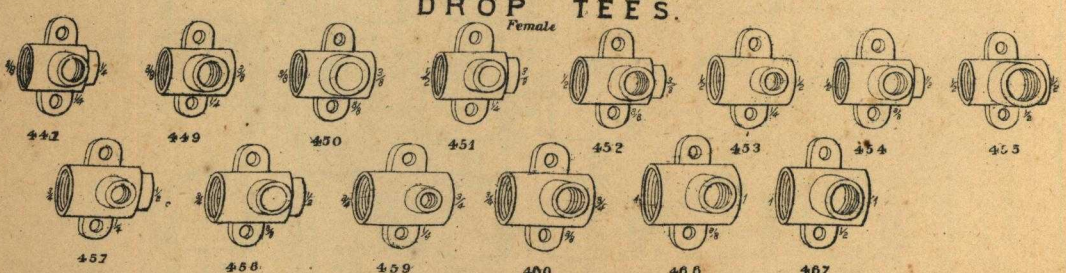
DROP ELBOWS

Flanges Right and Left



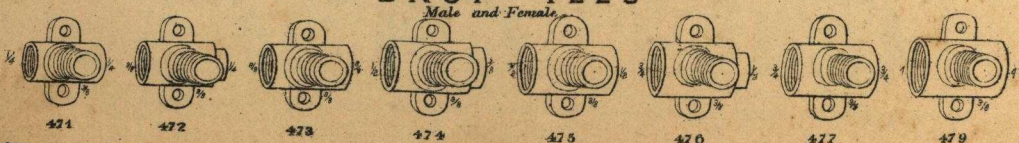
DROP TEES.

Female



DROP TEES

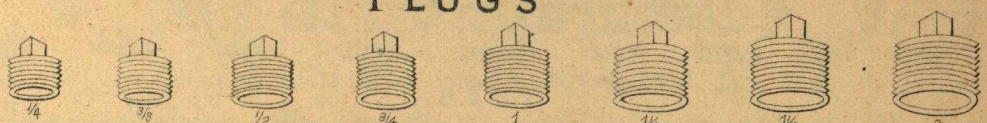
Male and Female



CAPS

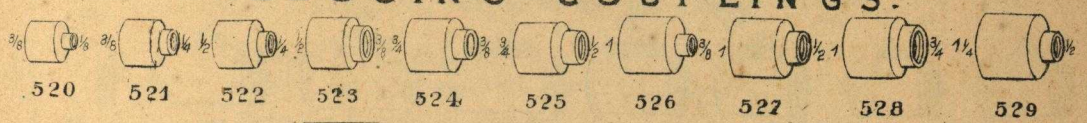
486 487 488 489 490 491 492 493

PLUGS



503 504 505 506 507 508 509 510

REDUCING COUPLINGS.



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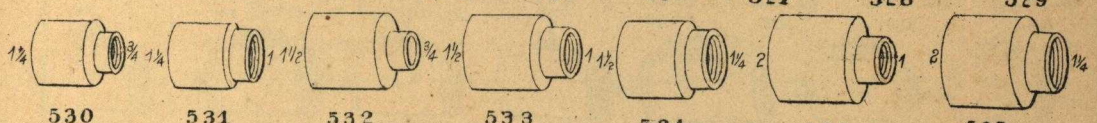

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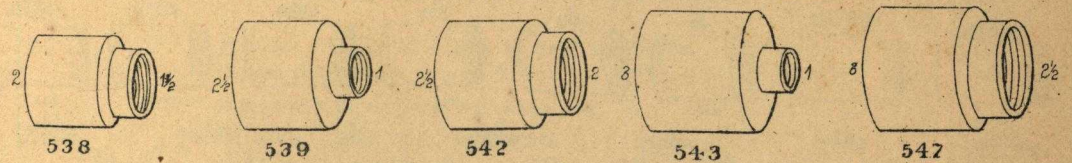
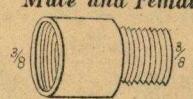


538 539 542 543 547

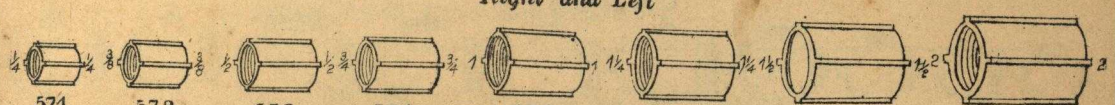
EXTENSION PIECES

Male and Female



COUPLINGS

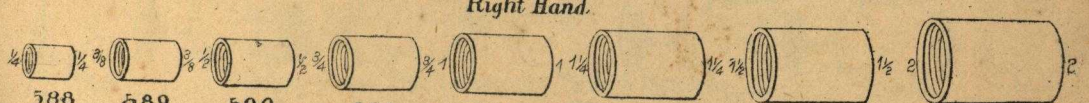
Right and Left



571 572 573 574 575 576 577 578

COUPLINGS

Right Hand.



588 589 590 591 592 593 594 595

LOCK NUTS

601 602 603 604 605 606 607 608

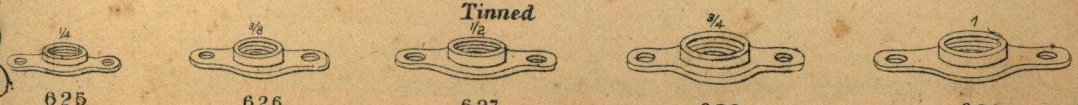
STRAPS

Tinned

614 615 616 617 618

WASTE NUTS

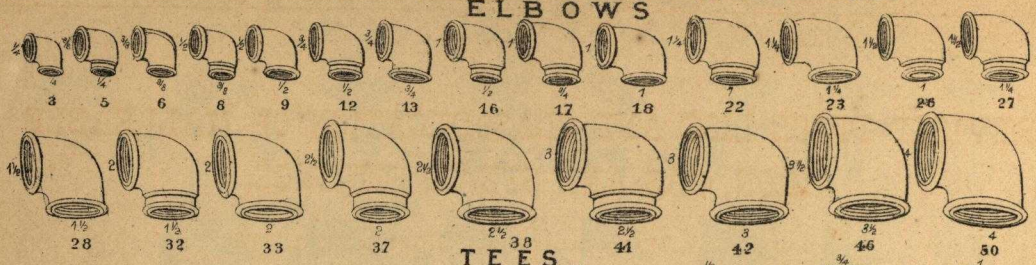
Tinned



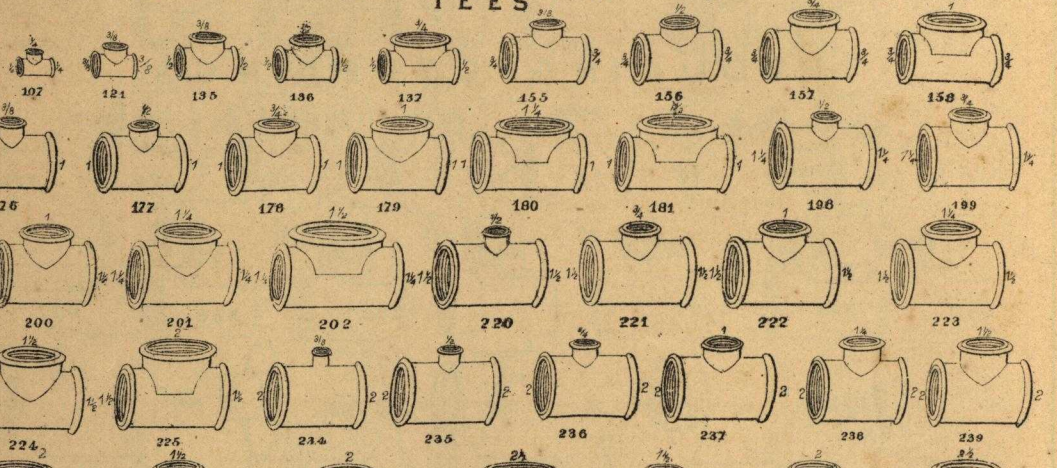
625 626 627 628 629

MALLEABLE IRON STEAM FITTINGS.

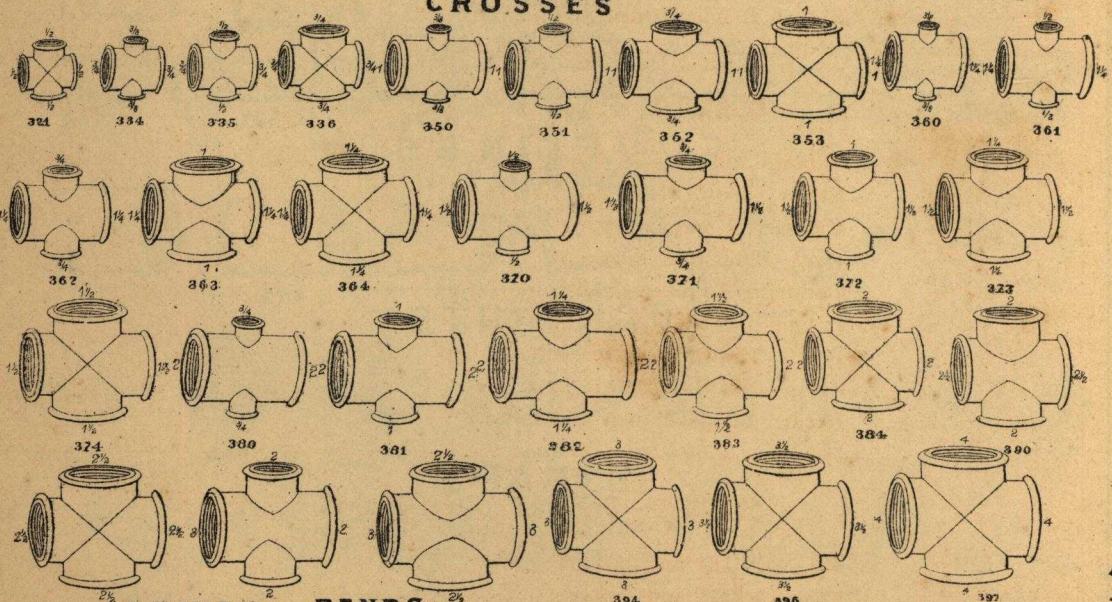
ELBOWS



TEES



CROSSES

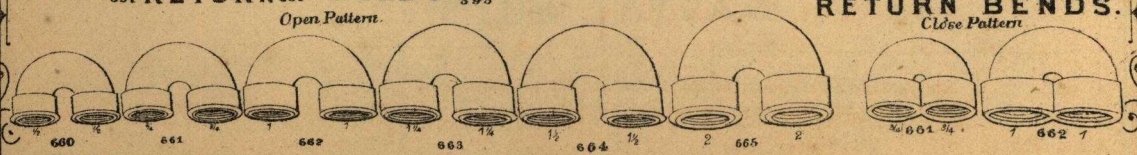


RETURN BENDS.

Open Pattern.

RETURN BENDS.

Close Pattern



REVISED PRICE LIST AND CLASSIFICATION OF MALLEABLE IRON, GAS AND STEAM FITTINGS,

ADOPTED BY MANUFACTURERS, NOVEMBER 1, 1879.

CLASS A.—Price, 25 cts. per Pound.

Elbows, $\frac{1}{8}$, $\frac{1}{4}$x$\frac{1}{8}$, $\frac{3}{8}$x$\frac{1}{8}$.
Tees, $\frac{1}{8}$, $\frac{3}{8}$x$\frac{1}{4}$, $\frac{1}{4}$x$\frac{1}{8}$, $\frac{3}{4}$x$\frac{1}{8}$.
Reducing Couplings, $\frac{1}{4}$x$\frac{1}{8}$, $\frac{3}{4}$x$\frac{1}{8}$.
Couplings, R. H., $\frac{1}{8}$.

CLASS B.—Price, 16 cts. per Pound.

Elbows and Tees, $\frac{1}{4}$ inch to $\frac{1}{2}$x$\frac{3}{8}$, inclusive.
Street Elbows, $\frac{1}{2}$, $\frac{3}{4}$ and 1.
Elbows, side outlets, all sizes.
Crosses, $\frac{1}{4}$ to 1 inch, inclusive.
Drop Ls and Drop Tees, all sizes.
Caps, Plugs and Locknuts, $\frac{1}{4}$ to 1 inch, inclusive.
Reducing Couplings, $\frac{3}{8}$x$\frac{1}{4}$ to 1x$\frac{3}{4}$, inclusive.
Extension Pieces.
R. and L. Couplings, $\frac{1}{4}$ to $\frac{3}{4}$, inclusive.
R. H. Couplings, $\frac{1}{4}$ and $\frac{3}{8}$.
Waste Nuts. Chandelier Hooks.
Return Bends, $\frac{3}{4}$ inch and smaller.

CLASS C.—Price, 14 cts. per Pound.

Elbows and Tees, $\frac{1}{2}$, $\frac{3}{4}$ and 1.
Street Elbows, 1$\frac{1}{4}$x1 and larger.
Crosses, 1$\frac{1}{4}$ and larger.
Caps, Plugs and Locknuts, 1$\frac{1}{4}$ and larger.
Reducing Couplings, 1$\frac{1}{4}$x$\frac{1}{2}$ and larger.
R. and L. Couplings, 1 and larger.
R. H. Couplings, $\frac{1}{2}$, $\frac{3}{4}$ and 1.
Straps (not tinned), all sizes.
Return Bends, 1 inch and larger.

CLASS D.—Price, 12 cts. per Pound.

Elbows, 1$\frac{1}{4}$x1 and larger.
Tees, 1$\frac{1}{4}$x$\frac{3}{8}$x1$\frac{1}{4}$ and larger.
R. H. Couplings, 1$\frac{1}{4}$ and larger.

Galvanized and Tinned Fittings, 5 cents per pound extra.
When ordering Malleable Fittings, order by numbers. See pages 223, 224, 225 and 226.

CAST IRON FITTINGS FOR WROUGHT IRON GAS PIPE.

ELBOWS—Cast Iron.

Size, in inches	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price, each	$0 04	0 05	0 08	0 11	0 15	0 21	0 30	0 60	0 90	1 20	1 60	2 00	2 50	3 50	7 00	10 00	13 00	17 00

TEES—Cast Iron.

Size, in inches	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price, each	$0 06	0 08	0 12	0 16	0 21	0 31	0 45	0 90	1 35	1 80	2 40	3 00	3 75	5 25	10 00	15 00	20 00	25 00

CROSSES—Cast Iron.

Size, in inches	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price, each	$0 15	0 20	0 30	0 42	0 60	1 20	1 80	2 40	3 20	4 00	5 00	7 00	14 00	20 00	26 00	34 00

45° ELBOWS—Cast Iron.

Size, in inches	⅛	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price, each	$0 10	0 15	0 20	0 26	0 35	0 50	1 30	1 60	1 90	2 50	3 50	4 50	5 50

PLUGS—Cast Iron.

Size, in inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10
Price, each	$0 03	0 03	0 04	0 05	0 06	0 08	0 11	0 16	0 25	0 45	0 60	0 80	1 00	1 30	1 90	3 75	5 50	7 50

REDUCERS—Cast Iron.

Size, in inches	3	3½	4	5	6
Price, each	$1 00	1 50	2 00	2 50	4 00

WROUGHT IRON COUPLINGS.

Size, in inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price, Plain, each	$0 05	0 05	0 06	0 07	0 10	0 13	0 17	0 21	0 28	0 40	0 60	0 80	1 00	1 25	1 65	2 40	3 25	4 25	5 25	7 50
Price, Galvanized, each	0 06	0 06	0 08	0 10	0 13	0 18	0 25	0 32	0 40	0 55	0 80	1 05	1 40	1 75	2 25	3 25				

BUSHINGS—Cast Iron.

Size, in inches	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price, each	$0 06	0 07	0 08	0 10	0 14	0 20	0 30	0 45	0 60	0 80	1 00	1 30	1 90	3 75	5 50

CAST IRON FITTINGS FOR WROUGHT IRON GAS PIPE.

CAPS.

Size, inches	3⅛	4	4⅛	5	6	7	8	9	10
Price, each	$0 85	1 15	1 45	1 75	2 30	3 10	4 35	5 60	6 80

LOCK-NUTS.

Size, inches	2½	3	3½	4	4½	5	6
Price, each	$0 25	0 45	0 60	0 80	1 00	1 30	1 90

RETURN BENDS AND "Y" BENDS.

Size, inches	¾	1	1¼	1½	2	2½	3	4
Close Pattern, distance between centres, inches	1½	1¾	2¼	2¼	3¼	3¼	4½	11
Close Pattern, price, each	$0 14	0 16	0 28	0 40	0 55	1 50	2 25	5 00
Close Pattern R. & L., with pitch made to order, price, each	$0 18	0 20	.....	.....	.....	.....	.....	.....
Open Pattern, distance between centres, inches	1⅞	2¼	.....	.....	.....	.....	.....	.....
Open Pattern, price, each	$0 17	0 19	.....	.....	.....	.....	.....	.....
Y Bends, price, each	$0 30	0 40	0 60	0 90	1 25	.....	.....	.....

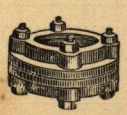
In ordering Close Pattern Return Bends for Coils, always state the length of tubes to be used in the Coils, so that the spread of the tubes will be allowed for.

One inch Return Bends, suitable for Coils, from 3 to 8 feet long, and ¾ inch Return Bends, suitable for Coils, from 3 to 4½ feet long.

Also R. & L. and R. H. Close Pattern Return Bends, straight, are kept in stock.

FLANGE UNIONS,

INCLUDING BOLTS AND PACKING.



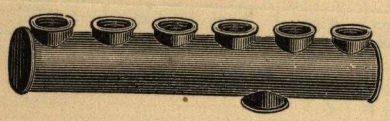
Size, inches	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Diameter of Flange, inches	4⅛	4⅜	5⅛	5⅝	6⅝	6⅞	7½	8¼	9¼	10¼	12	13	14	16
Price, each	$0 80	1 00	1 20	1 50	1 90	2 30	2 80	3 50	5 00	6 50	8 00	10 00	12 00	14 00

CAST IRON FITTINGS.

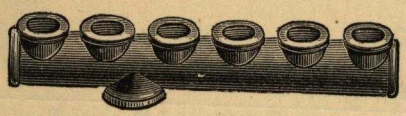
BRANCH TEES.

FOR BOX COILS.

LARGE PATTERN.

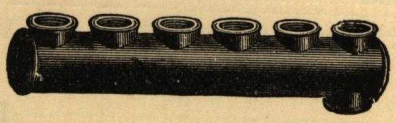


SMALL PATTERN.

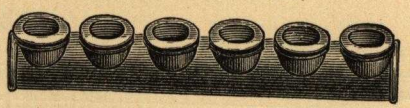


FOR CIRCULATION.

LARGE PATTERN.



SMALL PATTERN.



Number of Branches	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
For 1 in. Pipe, 2⅛ in. between centers. Small pattern.	$0 70	0 75	0 80	0 90	1 00	1 20	1 40	1 60	1 80	...	....	....	....	....	....
For 1¼ in. Pipe. Small pattern	1 10	1 15	1 20	1 35	1 50	1 80	2 10	2 40	2 75	....	....	....	...	....	....
For 1 in. Pipe, 2¼ in. between centers. Large pattern.	0 80	0 85	0 95	1 15	1 40	1 70	2 00	2 30	2 60	3 50	4 00	4 50	5 00	5 75	6 50
For ¾ in. Pipe, 2 in. between centers. Large pattern.	0 55	0 65	0 80	0 95	1 10	1 25	1 40	1 60	1 90	2 20	2 50	....	....	....	....
For 1¼ in. Pipe. Large pattern	1 40	1 50	1 60	1 80	2 00	2 30	2 60	2 90	3 25	....	...	....	....	....	....

NOTE.—Small Pattern for *Circulation* have inlets and outlets at the ends.
Small Pattern for *Box Coils*, are tapped left hand, and have a back outlet only.
Inlets and outlets of the 6 to 9 branch can be tapped for 1¼ inch.
Large Pattern for Circulation have inlet at one end, and outlet on back.
Large Pattern for Box Coils are tapped left hand, and have a back outlet only.
Can make to order, at an extra charge, the following, viz: 1 inch Branch Tees, the inlets and outlets of which may be tapped for 1¼, 1½ or 2 inch.
And ¾ inch Branch Tees, the inlets and outlets of which may be tapped for 1 or 1¼ inch.
Inlets and outlets same size as branches, unless specially ordered.
When Branch Tees are ordered left hand, we take it for granted they are for Box Coils and will so fill the order. If left hand are wanted for Circulation, THE ORDER MUST DISTINCTLY STATE THAT FACT.
In all cases, please state for what purpose the Branch Tees are required, Box Coils or Circulation.

HOOK PLATES.

No. of Hooks	2	3	4	5	6	7	8
For ¾ inch Pipe	$0 06	0 09	0 12	0 15	0 18	0 22	0 27
For 1 inch Pipe	0 13	0 15	0 19	0 24	0 30	0 35	0 40
For 1¼ inch Pipe	0 18	0 22	0 25	0 32	0 42	0 48	0 52
Expansion Hooks, ¾ inch Pipe	0 09	0 12	0 15	0 18	0 21	0 25	0 30
Expansion Hooks, 1 inch Pipe	0 14	0 17	0 20	0 30	0 35	0 40	0 45
Expansion Hooks, 1¼ inch Pipe	0 20	0 25	0 30	0 40	0 50	0 55	0 60

CAST IRON FITTINGS—Continued.

CAST IRON FLANGES.

Size of Pipe, inches.....	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10
Diameter, 3 inches....	$0 14															
Diameter, 3½ inches...	0 17	0 18														
Diameter, 4 inches....	0 20	0 21	0 22	0 24												
Diameter, 4½ inches...	0 23	0 25	0 26	0 28	0 31											
Diameter, 5 inches....	0 26	0 29	0 31	0 33	0 36											
Diameter, 5½ inches....	0 29	0 33	0 36	0 38	0 41	0 44										
Diameter, 6 inches....	0 32	0 38	0 42	0 44	0 47	0 50	0 55									
Diameter, 6½ inches....	0 35	0 43	0 48	0 50	0 53	0 56	0 61	0 64								
Diameter, 7 inches....		0 49	0 54	0 56	0 60	0 63	0 70	0 73	0 75							
Diameter, 7½ inches....		0 55	0 61	0 63	0 68	0 71	0 79	0 84	0 87							
Diameter, 8 inches....			0 68	0 70	0 78	0 81	0 89	0 96	1 00	1 04						
Diameter, 8½ inches....			0 75	0 78	0 88	0 91	1 00	1 08	1 13	1 22						
Diameter, 9 inches....				0 88	0 98	1 02	1 15	1 22	1 26	1 40	1 55	1 65				
Diameter, 9½ inches....					1 08	1 15	1 30	1 37	1 40	1 58	1 70	1 80	2 20			
Diameter, 10 inches....						1 29	1 45	1 52	1 56	1 76	1 90	2 00	2 40			
Diameter, 10½ inches....						1 44	1 62	1 69	1 74	1 96	2 10	2 20	2 60			
Diameter, 11 inches....						1 60	1 80	1 90	1 95	2 16	2 32	2 40	2 80			
Diameter, 11½ inches....							2 00	2 12	2 18	2 36	2 54	2 60	3 00			
Diameter, 12 inches....							2 25	2 35	2 42	2 56	2 76	2 80	3 20	3 75	4 00	
Diameter, 13 inches....								2 60	2 68	2 80	3 00	3 05	3 45	4 10	4 50	
Diameter, 14 inches....										3 05	3 25	3 35	3 75	4 50	5 00	6 00
Diameter, 15 inches....														5 00	5 60	6 60
Diameter, 16 inches....														5 50	6 25	7 25
Diameter, 17 inches....														6 10	6 90	8 00

Circle Flanges made to order at double above prices.

MALLEABLE IRON FITTINGS FOR WROUGHT IRON GAS PIPE.

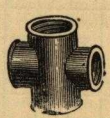
ELBOWS.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price, each	$0 04	0 04	0 05	0 06	0 09	0 16	0 23	0 32	0 50	0 75	1 40	2 05	2 80
Street Ells, each				0 17	0 20	0 25	0 42	0 65	1 10				

TEES.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price, each	$0 05	0 05	0 06	0 08	0 12	0 19	0 26	0 40	0 60	1 00	1 60	2 40	3 20

CROSSES.



Size, inches	⅜	½	¾	1	1¼	1½	2	2½	3	4
Price, each	$0 07	0 10	0 17	0 26	0 35	0 54	0 80	1 70	2 60	3 75

BUSHINGS,

REDUCING ONE SIZE ONLY.

Size, inches	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each	$0 05	0 06	0 07	0 08	0 10	0 14	0 20	0 30	0 45

CAPS.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price, each	$0 03	0 03	0 05	0 08	0 11	0 15	0 22	0 30	0 45	0 65	0 85	1 15

MALLEABLE IRON FITTINGS—Continued.

LOCK-NUTS.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2
Price, each	$0 03	0 03	0 04	0 05	0 06	0 08	0 11	0 16

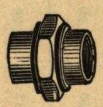
REDUCERS.

Size, inches	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price, each	$0 04	0 06	0 10	0 15	0 21	0 28	0 44	0 64	1 00	1 50	2 00

COUPLINGS—Right and Left.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2
Price, each	$0 03	0 04	0 06	0 10	0 15	0 21	0 28	0 44

UNIONS.



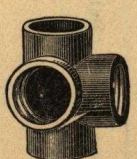
Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	4
Price, each	$0 14	0 16	0 19	0 23	0 28	0 38	0 48	0 72	1 35	2 10	4 00

½ inch and larger made either plain or with lip joint. Unless ordered otherwise, plain joints will be sent.

RETURN BENDS.

Size, inches	½	¾	1	1¼	1½	2	2½
Price, Open Pattern, each	$0 12	0 19	0 26	0 44	0 64	1 00	1 25
Distance between Centers, inches	1¼	1½	1⅞	2¼	2½	3	4

FOUR WAY TEES.



Size, inches	¾	1
Price, each	$0 30	0 35

GALVANIZED IRON FITTINGS,

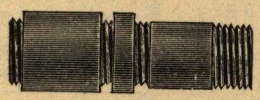
BEADED PATTERN.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Elbows (Malleable)	$0 05	0 06	0 08	0 12	0 22	0 32	0 45	0 72	1 10	2 10	3 10	4 10			
Tees (Malleable)	0 06	0 07	0 10	0 16	0 26	0 36	0 56	0 86	1 40	2 40	3 50	4 60			
Crosses (Malleable)		0 08	0 12	0 22	0 35	0 48	0 70	1 10	2 30	3 50		5 00			
Return Bends (Malleable)			0 15	0 24	0 35	0 60	0 85	1 35							
Couplings, R. & L. (Malleable)	0 04	0 05	0 08	0 13	0 20	0 28	0 36	0 60							
Reducers (Malleable)		0 05	0 08	0 13	0 20	0 28	0 36	0 60	0 85	1 30	90	2 50			
Caps (Malleable)	0 05	0 05	0 07	0 10	0 14	0 20	0 30	0 40	0 60	0 90	1 20	1 60			
Plugs (Cast)	0 05	0 05	0 06	0 07	0 09	0 11	0 16	0 24	0 40	0 65	0 90	1 20	1 50	2 10	3 00
Unions (Malleable)	0 18	0 22	0 26	0 34	0 42	0 55	0 70	1 04	1 80	2 80		5 60			
Bushings (Malleable)		0 07	0 08	0 09	0 11	0 15	0 20	0 30	0 45	0 65	0 90	1 20	1 50	2 10	3 00
Nipples, Close or Short	0 07	0 08	0 09	0 11	0 13	0 17	0 23	0 32	0 65	0 75	1 00	1 40	1 90	2 40	3 50
Nipples, Long	0 09	0 11	0 13	0 16	0 19	0 24	0 31	0 40	0 85	1 10	1 40	1 90	2 40	3 00	4 40

Galvanized Cast Iron and Plain Malleable Fittings made to order. Galvanized Fittings kept in stock as per table of sizes and numbers.

LONG SCREWS,

WITH COUPLING AND LOCK-NUT FACED.



Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Standard length, inches	2½	3	3½	4½	5	5½	6	6½	7	8
Price, standard length, each	$0 30	0 35	0 40	0 55	0 75	1 00	1 30	1 70	2 70	3 70

Long Screws longer than Standard made to Order and charged as CUT PIPE. THREADS, COUPLINGS and LOCK-NUTS, EXTRA.

LOCK-NUT NIPPLES,

Made to Order and Charged as Cut Pipe. Threads Extra.

WROUGHT IRON COUPLINGS, FACED,

FOR LOCK-NUT JOINTS.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each, plain	$0 09	0 10	0 12	0 16	0 22	0 30	0 40	0 50	0 70	0 90

ROUND LOCK-NUTS, FACED.

Sice, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each, plain	$0 08	0 09	0 10	0 12	0 15	0 20	0 25	0 30	0 35	0 45

ROUND BUSHINGS, FACED.

CAST IRON.

Size, inches	¾	1	1¼	1½	2
Price, each, plain	$0 11	0 13	0 16	0 19	0 26

FOR CUTTING THREADS ON PIPE.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, Lock-Nut Threads, each	$0 10	0 10	0 10	0 10	0 12	0 14	0 16	0 20	0 30	0 40

Close.

NIPPLES.

TABLE OF SIZES AND LENGTHS KEPT IN STOCK.

Shoulder.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Length of Close, inches	¾	⅞	1	1⅛	1⅜	1½	1⅝	1¾	2	2⅛	2½	2¾	3	3	3½	3½	4	4		
Length of Short, inches	1⅛	1⅛	1½	1⅛	2	2	2⅛	2⅛	2⅛	3	3	4	4	4	4½	4½	5	5		
1st Length Long Nipples, inches	2	2	2	2	2⅛	2⅛	3	3	3	3½	3½	4½	4½	4½	5	5				
2d Length Long Nipples, inches	2½	2½	2½	2½	3	3	3½	3½	3½	4	4	5	5	5	5½	5½				
3d Length Long Nipples, inches	3	3	3	3	3½	3½	4	4	4	4½	4½	5½	5½	5½	6	6				
4th Length Long Nipples, inches	3½	3½	3½	3½	4	4	4½	4½	4½	5	5	6	6	6	6½	6½				

PRICES.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	
Price of Close or Short	$0 05	0 05	0 06	0 07	0 09	0 10	0 14	0 17	0 25	0 56	0 75	1 00	1 25	1 50	2 00	2 75	4 00	5 75			} Subject to Fittings Dis.
Price of Long	0 07	0 07	0 09	0 10	0 11	0 15	0 20	0 25	0 35	0 75	0 95	1 25	1 60	2 00	2 60	3 60					
Price of Piece Pipe, 5 in. long, with 2 threads	0 16	0 16	0 17	0 18	0 20	0 22	0 29	0 36	0 44												} Subject to cut Pipe Dis.
Price of Piece Pipe, 6 in. long, with 2 threads	0 17	0 17	0 18	0 19	0 21	0 24	0 31	0 38	0 49	0 75	0 97						3 90	4 95	6 40	7 90	
Price of Piece Pipe, 7 in. long, with 2 threads	0 18	0 18	0 19	0 20	0 22	0 27	0 33	0 40	0 54	0 83	1 06	1 38	1 75	2 20	2 70	3 30	4 30	5 40	7 00	8 65	
Price of Piece Pipe, 8 in. long, with 2 threads	0 19	0 19	0 20	0 21	0 23	0 29	0 35	0 42	0 59	0 91	1 15	1 50	1 92	2 38	2 95	3 60	4 70	5 85	7 60	9 40	
Price of Piece Pipe, 9 in. long, with 2 threads	0 20	0 20	0 21	0 22	0 25	0 31	0 38	0 45	0 64	1 00	1 24	1 62	2 10	2 56	3 20	3 90	5 10	6 30	8 20	10 20	
Price of Piece Pipe, 10 in. long, with 2 threads	0 21	0 21	0 22	0 23	0 27	0 33	0 40	0 48	0 69	1 10	1 34	1 74	2 30	2 75	3 45	4 20	5 50	6 75	8 80	11 00	
Price of Piece Pipe, 11 in. long, with 2 threads	0 22	0 22	0 23	0 25	0 29	0 36	0 43	0 51	0 74	1 20	1 44	1 86	2 50	2 94	3 80	4 50	5 90	7 20	9 40	11 80	
Price of Piece Pipe, 12 in. long, with 2 threads	0 23	0 23	0 25	0 27	0 31	0 40	0 46	0 55	0 79	1 30	1 55	2 00	2 70	3 15	4 20	4 80	6 30	7 65	10 00	12 60	

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, Right and Left, Short	$0 10	0 10	0 12	0 15	0 18	0 24	0 30	0 40	1 00	1 25

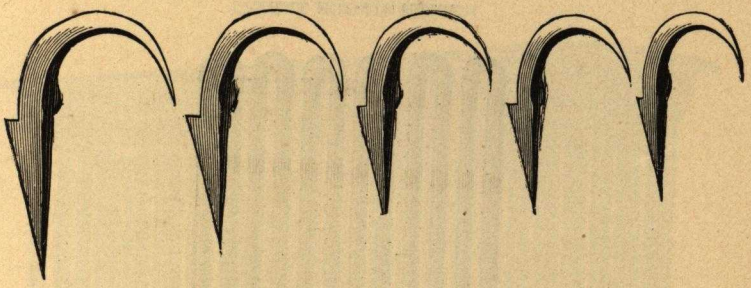
Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, Right and Left, Long	$0 12	0 14	0 16	0 20	0 24	0 35	0 46	0 60	1 30	1 60

CLOSE NIPPLES will always be sent, if not otherwise ordered.

FOR CUTTING THREADS ON PIPE.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price, each	$0 05	0 05	0 05	0 05	0 05	0 06	0 07	0 08	0 10	0 15	0 20	0 25	0 35	0 45	0 55	0 70	0 85	1 00	1 25	1 50

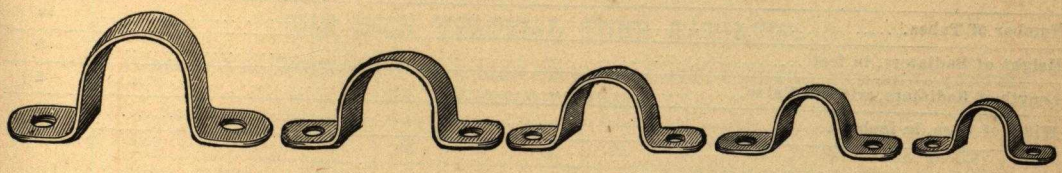
GAS HOOKS.



GAS HOOKS.

Size of Pipe, inches	¼	⅜	½	¾	1	1¼	1½
Price of Hooks, per 100	$0 80	0 80	0 80	1 20	1 50	2 00	3 00

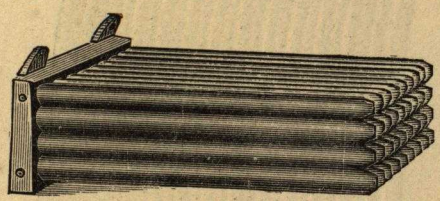
TINNED STRAPS.



TINNED STRAPS.

Size of Pipe, inches	¼	⅜	½	¾	1	1¼	1½
Price of Straps, per 100	$1 00	1 00	1 00	1 50	2 00	2 50	3 50

INCLINED TUBE INDIRECT RADIATOR.



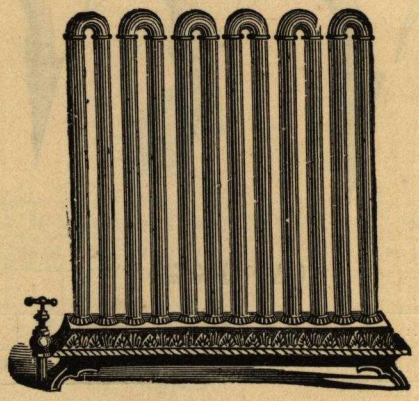
This Radiator has lugs for bolting to the side walls or to a floor-joist, in such position as to give the tubes the proper inclination for drainage into the base.

It is made of free end tubes, each tube having a diaphragm dividing it into two parts to permit a free circulation of steam and water of condensation. Each row of tubes is placed opposite the spaces between the adjoining rows, and the tubes are placed very close together, thus dividing the current of air and bringing it in direct contact with the entire surface of the Radiator.

This Radiator possesses numerous advantages over the old style of Box Coil or over Cast Iron Sectional Radiators. It heats up quickly, as the steam enters all the tubes at one time, and only travels a distance of 26 to 30 inches to reach the end of the tube, and the water of condensation from each tube passes into the base and out of the return pipe so freely as to avoid danger from freezing, so incident to box coils. It is quickly and easily put up, is very compact, requiring but little space, and is durable and effective in operation. Prices given on application.

ONE INCH VERTICAL RADIATOR,

WITH SINGLE TUBE.



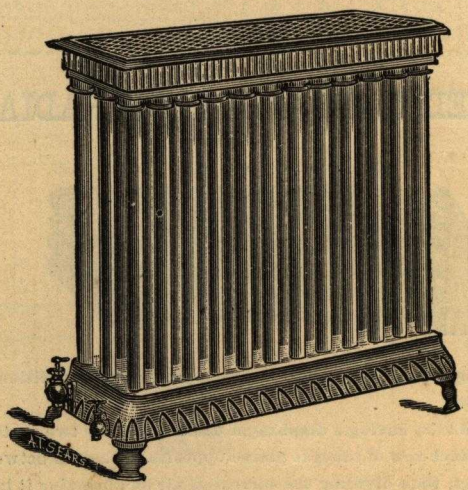
ONE INCH VERTICAL RADIATOR,

WITH SINGLE TUBE.

Number of Tubes	12
Height of Radiators, in feet	3
Length of Radiators, without Valve	2½
Width of Base, in inches	5

ONE INCH VERTICAL RADIATOR,

THREE TUBES WIDE, FURNISHED WITH IRON OR MARBLE TOP. PAINTED AND ORNAMENTED IN ANY STYLE DESIRED.

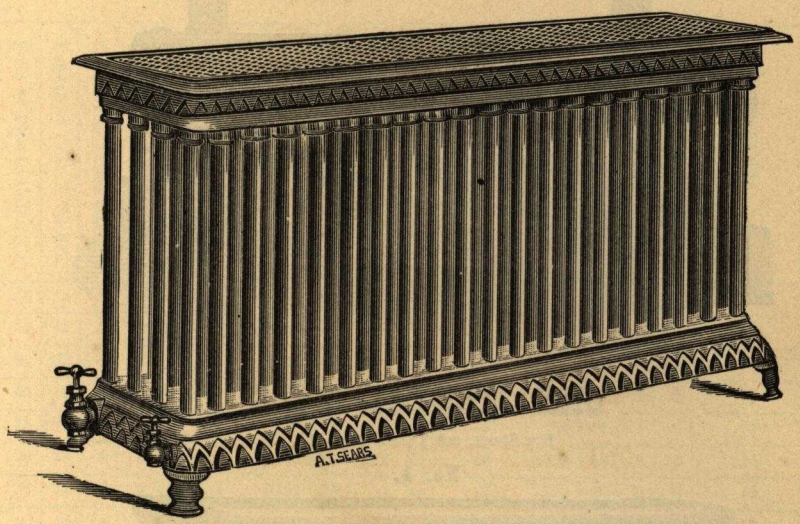


Number of Tubes	12	18	24	30	36
Height of Radiator, in feet		3 1-12	3 1-12	3 1-12	3 1-12
Length of Base, without Valve	ft. 1	ft. in. 1 3¼	ft. in. 1 8	ft. in. 2 ¾	ft. in. 2 5½.
Width of Base, in inches		9	9	9	9

Prices given on application.

ONE INCH VERTICAL TUBE RADIATOR,

FOUR TUBES WIDE. FURNISHED WITH IRON OR MARBLE TOP, PAINTED AND ORNAMENTED IN ANY STYLE DESIRED.



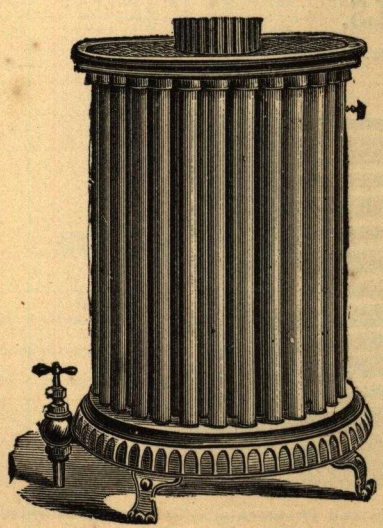
ONE INCH VERTICAL TUBE RADIATOR,

FOUR TUBES WIDE. FURNISHED WITH IRON OR MARBLE TOP, PAINTED AND ORNAMENTED IN ANY STYLE DESIRED.

Number of Tubes.....	40	48	56	64	72	80	88	96	104	112	120
Height of Radiator, in feet.....	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12	3 2-12
Length of Radiator, without Valve.	ft. in. 2 ¾	ft. in. 2 5½	ft. in 2 10¼	ft. in. 3 3½	ft. in. 3 7½	ft. in. 4 0	ft. in. 4 5¼	ft. in. 4 10	ft. in. 5 2¼	ft. in. 5 7	ft. in. 6 0
Width of Base, in inches.....	12	12	12	12	12	12	12	12	12	12	12

No. 1, ROUND RADIATOR,

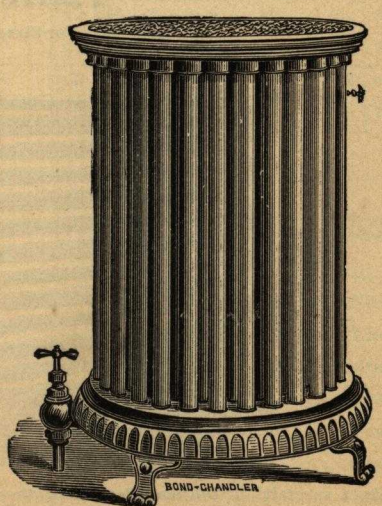
To place around Columns in Stores and Office Buildings.



No. 1—NUMBER OF TUBES, 140.

No. 2, ROUND RADIATOR,

For general use.

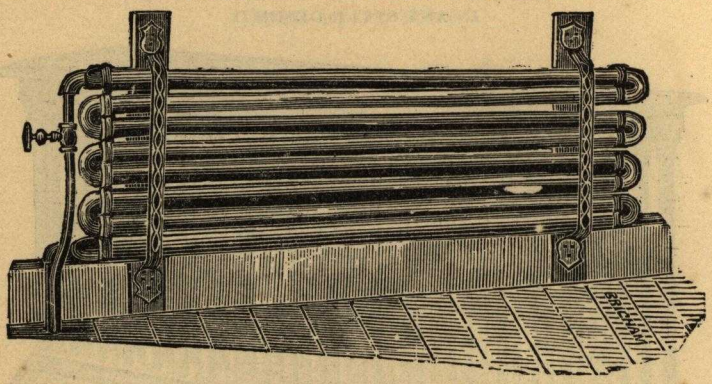


No. 2—NUMBER OF TUBES, 34-60.

Prices given on application.

ORNAMENTAL COILS,

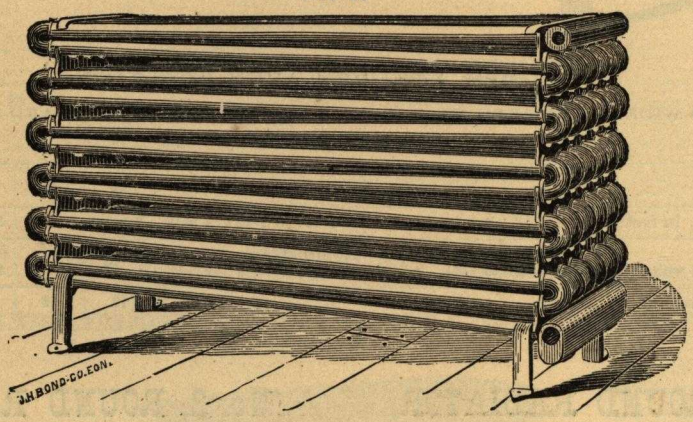
BRACKET PATTERN, ONE AND TWO TUBES WIDE.



ORNAMENTAL COILS.

For Sizes, see Table, page 241.

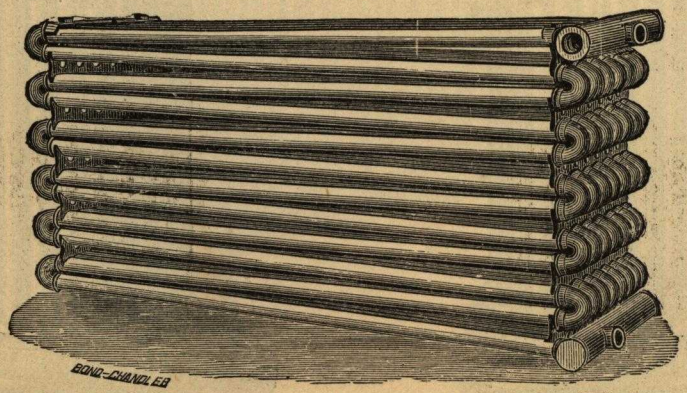
No. 1.



PLAIN BOX COILS.

For Sizes, see Table, page 241.

No. 2.



We make a specialty of the manufacture of these goods, both Plain and Ornamental. Coils made to order, of intermediate lengths from those described in list, will be furnished at the same price per foot as the next length shorter.

The following Tables of Coils will prove of value, as they contain a great variety of shapes and sizes, with the number of feet in each Coil, enabling you to select one suitable for almost any place desired. Prices on application.

TABLE OF NUMBERS AND SIZES OF ONE INCH ORNAMENTAL COILS.

Number of Coils.	Feet of Pipe in Coil.	Length of Coil, in inches.	Number of Pipes wide.	Number of Pipes high.	Number of Coils.	Feet of Pipe in Coil.	Length of Coil, in inches.	Number of Pipes wide.	Number of Pipes high.	Number of Coils.	Feet of Pipe in Coil.	Length of Coil, in inches.	Number of Pipes wide.	Number of Pipes high.	Number of Coils.	Feet of Pipe in Coil.	Length of Coil, in inches.	Number of Pipes wide.	Number of Pipes high.
1	56	39	3	6	26	156	39	6	8	51	250	50	6	10	76	368	46	8	12
2	58	41	3	6	27	164	41	6	8	52	250	60	5	10	77	375	50	9	10
3	61	32	4	6	28	166	50	4	10	53	250	50	5	12	78	392	46	10	10
4	69	46	3	6	29	167	50	5	8	54	266	50	8	8	79	395	74	8	8
5	75	37½	4	6	30	170	50	5	10	55	269	46	7	10	80	400	60	8	10
6	78	39	4	6	31	175	37½	7	8	56	273	41	8	10	81	400	88	7	8
7	82	41	4	6	32	182	39	7	8	57	276	46	6	12	82	410	50	8	12
8	92	46	4	6	33	184	46	6	8	58	280	60	7	8	83	414	46	9	12
9	94	37½	5	6	34	191	41	7	8	59	287	41	7	12	84	417	50	10	10
10	97	39	5	6	35	192	46	5	10	60	292	50	7	10	85	420	60	7	12
11	100	50	4	6	36	200	37½	8	8	61	296	74	6	8	86	432	74	7	10
12	100	37½	4	8	37	200	60	5	8	62	300	60	6	10	87	440	88	6	10
13	102	41	5	6	38	200	60	4	10	63	300	60	5	12	88	444	74	6	12
14	104	39	4	8	39	200	50	6	8	64	306	46	8	10	89	450	60	9	10
15	109	41	4	8	40	205	41	6	10	65	308	74	5	10	90	450	50	9	12
16	115	46	5	6	41	209	50	5	10	66	320	60	8	8	91	460	46	10	12
17	123	46	4	8	42	215	46	7	8	67	322	46	7	12	92	470	88	8	8
18	125	50	5	6	43	219	41	8	8	68	333	50	8	10	93	480	60	8	12
19	125	37½	5	8	44	230	46	6	10	69	345	74	7	8	94	493	74	8	10
20	130	39	5	8	45	230	46	5	12	70	345	46	9	10	95	500	60	10	10
21	134	50	4	8	46	233	50	7	8	71	350	60	7	10	96	500	50	10	12
22	137	41	5	8	47	239	41	7	10	72	350	50	7	12	97	513	88	7	10
23	150	37½	6	8	48	240	60	6	8	73	352	88	6	8	98	518	74	7	12
24	153	46	4	10	49	245	46	8	8	74	360	74	6	10	99	540	60	9	12
25	153	46	5	8	50	246	41	6	12	75	360	60	6	12	100	555	74	9	10

NUMBER OF PIPES WIDE.

Coils 3 pipes wide are..... 8 inches in width.
Coils 4 pipes wide are.....10½ inches in width.
Coils 5 pipes wide are.....13 inches in width.
Coils 6 pipes wide are.....15½ inches in width.
Coils 7 pipes wide are.....18 inches in width.
Coils 8 pipes wide are.....20½ inches in width.
Coils 9 pipes wide are.....23 inches in width.
Coils 10 pipes wide are.....25½ inches in width.

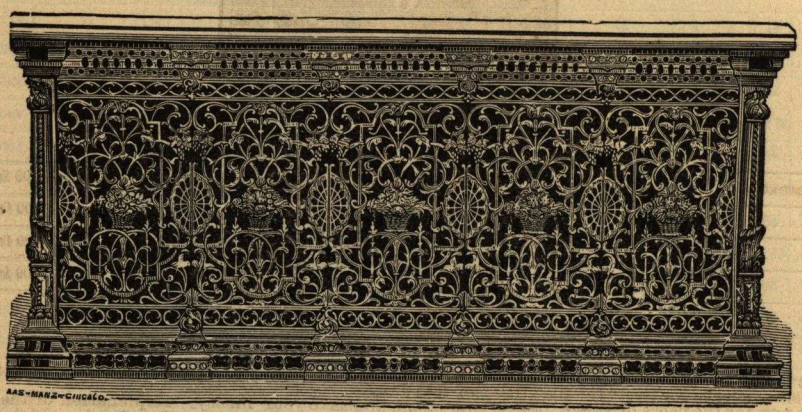
NUMBER OF PIPES HIGH.

Coils 6 pipes high, 4 feet long or less.....22 inches high.
Coils 8 pipes high, 4 feet long or less.....27 inches high.
Coils 10 pipes high, 4 feet long or less.....32 inches high.
Coils 12 pipes high, 4 feet long or less.....37 inches high.
Coils 6 pipes high, over 4 feet long.....25 inches high.
Coils 8 pipes high, over 4 feet long.....31 inches high.
Coils 10 pipes high, over 4 feet long.....37 inches high.
Coils 12 pipes high, over 4 feet long.....53 inches high.

ORNAMENTAL SCREEN,

WITH MARBLE TOP, FOR ENCLOSING COILS.

Pattern No. 1.



ORNAMENTAL SCREEN,

WITH MARBLE TOP, FOR ENCLOSING COILS.

Pattern No. 1.

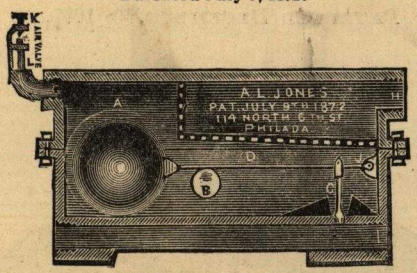
Width of Panels.....4¼ inches, 7 inches, 9 inches, 11 inches, 12⅞ inches and 14¾ inches.
Width of Front Corner Piece..... 2 inches.
Width of Back Corner Piece at Bottom..... 3 inches.
Width of Back Corner Piece at Top..... 4 inches.
Height under Marble.....2 feet 8 inches.

Made to required length, and painted any style desired. Finished in Bronze, Chocolate or Gold. Prices on application.

A. L. JONES' IMPROVED PATENT SELF-REGULATING STEAM TRAP.

THE CHAMPION TRAP OF THE WORLD, AND HAS BEEN SO DECIDED. RECEIVED HIGHEST AND ONLY MEDAL AND DIPLOMA AT CENTENNIAL EXHIBITION, 1876.

Patented July 9, 1872.



PRICE LIST.

NUMBER.	Price.
No. 1	$35 00
No 2	40 00
No. 3	60 00
No. 4	75 00

CAPACITY.

No. 1 will drain	1,500 feet 1 inch Pipe.
No. 2 will drain	3,000 feet 1 inch Pipe.
No. 3 will drain	7,000 feet 1 inch Pipe.
No. 4 will drain	10,000 feet 1 inch Pipe.

Read the explanation of the working of this Machine carefully. Eighteen thousand eight hundred of them now in use in seven years, speaks for itself for the utility of this Trap.

Something new for the users of steam. Save your steam and save your money. Explanation of the working of A. L. Jones' Improved Self-Regulating Steam Trap, by the above cut, inside view. The pipe by which steam enters is screwed in at H, the outlet pipe is at G, for steam connection, to be used only where steam is wanted to be carried further on; the waste or outlet pipe for condensed water to pass out is at the end that is most convenient. Should the steam not be wanted to go further than the trap at G, it is plugged up. It will be seen at once that it is a perfect steam drum as well as a trap; that dry steam can always be had, which makes it a valuable machine for Steam Engines to take the water out of pipe before passing into cylinder, or for taking water from exhaust pipe after passing the engine, where the steam is wanted for heating, as it takes no power from the engine to force condensed water through the pipes; the condensed water passes in through the pipes at H into conduct or strainer, which catches all refuse, and then into the basin in which is the ball float A. When the water in the trap reaches hollow rod D, it raises the float, which lifts the stem C from its seat, and the water passes out through the outlet. The hollow rod D is open at one end into the copper ball or float, and at the other through the side into the open air, so that the great difficulty and objection to hollow balls is overcome by this new and simple invention; any leakage or sweating in the float or ball is instantly evaporated into steam and passes out, which always keeps the float dry and the water at a uniform height in the trap. It is easily seen that it is impossible for any steam to escape; needs no attention whatever, and it makes no difference whether one pipe empties into it, or whether you waste a whole factory, it works the same. The faster the water runs in the higher the ball raises and lets the water out, and as the water stops coming in, the ball lowers and closes it up. The handle on the side is a cam or round wheel, with stem in one side, to turn up in winter and let the water all out to prevent freezing; to be used at no other time, unless something gets under seat of valve.

In placing this trap before the public, I do not wish to condemn any other inventor's trap, and make only one claim on this, and will leave this to be decided by the most scientific engineer or mechanic, or any user of steam; it is simply that this is the only principle on which a steam trap can be made to work itself perfectly and be reliable, and let no steam escape through it. For steamboats, drying rooms, heating pipes in buildings, cylinders, presses, pans and worms in sugar houses, or any place where steam is used, it is invaluable to catch all the condensed steam and return it back where it can be used over again. No water is as good to put into boilers as condensed water. You have not to depend on any one to watch the waste pipe to see if any steam is blowing out to waste; but, on the contrary, open your valves and let your steam in. It matters not whether you have five pounds of steam or a hundred, this machine is the watchman for the end of the pipe, to see that no steam escapes. This trap has been thoroughly tested, and proved the best trap in the world, as testimonials show.

In coal mines, where the pumps are generally situated a great distance from the boilers, these traps are invaluable for giving dry steam, and so prevent the flooding of the pumps with water. For references of the coal mines, send for circular.

This Trap was entered at the great Centennial Exhibition, Philadelphia, 1876, for competition against the world, with several other traps entered for the same purpose from all parts of the globe. They were all given a fair but close test for six months, and the decision of the judges was, that the Jones Steam Trap was the only one that was a perfectly self-regulating Steam Trap, simple in construction and not liable to get out of order; they therefore awarded it the only Diploma and Medal, as the best Steam Trap in the World. It was adopted by them to catch the condensed water, during all the tests of pumps and engines, at the Centennial, and adopted by the Permanent Exhibition Company, which has the finest and largest exhibition in the world, covering 22 acres of ground, and held in the Main Building—which is a good recommendation for the Trap. It has always taken the first and only prize given to steam traps, at all exhibitions where exhibited.

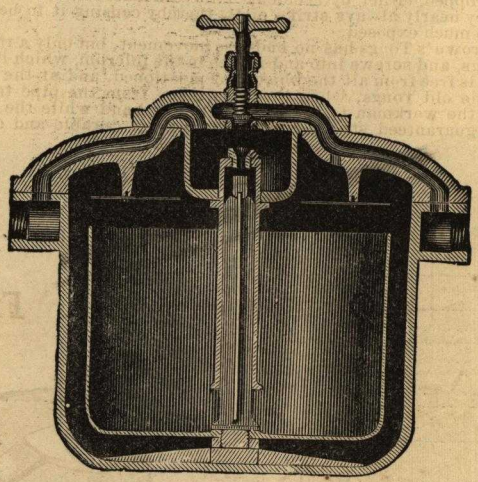
These Traps are in use in most of the large manufactories in the East, and all the public buildings in the United States, State and City Governments, from Omaha to Maine. They have been adopted in the State of California and used for two years at the United States Mint, San Francisco; State University, Berkeley; State Capitol Building, Sacramento; and have been introduced into the California Sugar Refinery and W. T. Garratt's Brass Foundry, San Francisco; Mills' Seminary, Brooklyn; State Insane Asylum, Stockton.

No Brewer's Kettle or Sugar Pan is complete without it. Every elevator engine needs it, and no building heated with steam is complete without this Trap. Finally, anybody can see that it is impossible to waste any steam through them, and that they will soon save their cost.

NASON IMPROVED STEAM TRAP,

FOR TAKING OFF THE WATER OF CONDENSATION FROM STEAM PIPES, COILS AND APPARATUS EMPLOYED IN STEAM HEATING AND EVAPORATING.

PATENTED DECEMBER 10, 1867.



NASON IMPROVED STEAM TRAP,

FOR TAKING OFF THE WATER OF CONDENSATION FROM STEAM PIPES, COILS AND APPARATUS EMPLOYED IN STEAM HEATING AND EVAPORATING.

The following table shows the number of square feet of heating surface in a common high-pressure Steam Heating Apparatus, which Steam Traps of the several sizes may be expected to drain under ordinary exposure to cooling. For very low pressures, either a larger size should be used, or a Steam Trap should be specially ordered, with enlarged valve opening:

Number of Steam Trap	1	2	3	4	5
Size of Pipe Connections, inches	½	¾	1	1¼	1½
Diameter of Cylinder, inches	8	10¼	12	14	18
Height to Top of Cover, inches	8	10	12	14	15½
Greatest number of square feet of surface to which it should be applied.	350	900	1,400	2,000	3,500
Price	$16 00	20 00	27 50	35 00	65 00

These numbers and sizes do not correspond with those of the Steam Traps heretofore manufactured by us. To prevent mistakes, therefore, in ordering from this list it should be stated that the numbers designated refer to Patent Steam Traps.

As a large assortment of the various sizes is kept on hand, orders will always be filled without delay.

Improved Steam Trap, especially designed f .r low pressure, each	$12 00

BROWN'S PIPE TONGS—IMPROVED.

(Patented November 4, 1873, and August 3, 1880.)

CAMBRIDGE, January 10, 1880.

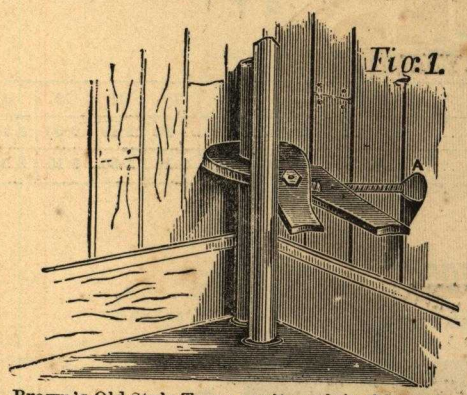
The immense sale of my ADJUSTABLE TONGS has induced me to make many efforts to overcome their imperfections, which experience has shown. I have finally succeeded, and in the IMPROVED TONGS, now for the first time offered to the trade, I have all that has been wished for. (Signed,) JAMES B. BROWN.

ADVANTAGES OVER THE OLD TONGS SECURED BY THE IMPROVEMENT.

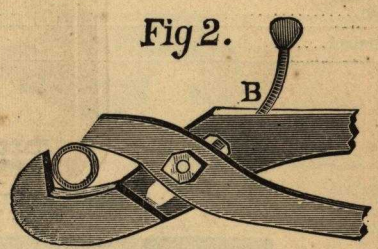
The Adjusting Screw in the old Tongs projects so far when the Tongs are opened, as to be in many cases seriously in the way, as shown at A, Fig. 1.

Another serious defect is, that this screw, being at the heaviest part of the Tongs, is often broken or bent, as seen at B, Fig. 2, when the Tongs are dropped, either by accident or for convenience. From the fact that the screw is at the heaviest part, it follows that they nearly always strike on it, thereby causing it to bend or break. Again, it is often clogged by dirt, to which it is too much exposed.

The Screw in the Improved Brown's Tongs has no endwise movement, but only a rotary motion, as it is fastened at its head to one blade of the Tongs, and screws into and moves in the fulcrum, which is bolted to the other blade; thus the SCREW NEVER PROJECTS, and is free from all the objections mentioned, and at the same time gives an adjustment which is not lost, as it is in the old Tongs, when they are taken from the pipe to be moved or laid down, or to change position, thus enabling the workman to use them with one hand while the other is left free for other uses. See C, Fig. 3. These tongs are guaranteed stronger, as well as more durable and every way more desirable, than any others manufactured.

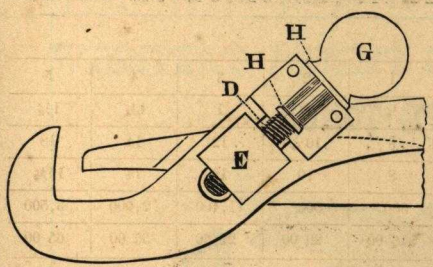


Brown's Old Style Tongs can't work in this case.



Brown's Old Style Tongs bent by dropping.

Brown's Improved Tongs in use on full sized Pipe.



Sectional View.

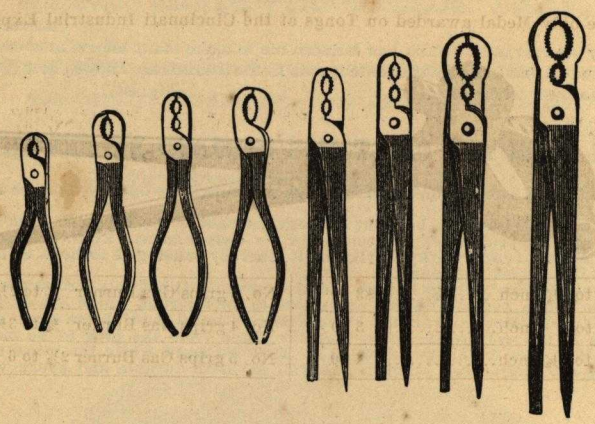
DESCRIPTION.

This cut shows the mode of fastening the Adjusting Screw in the beaded jaw of H and H, which slots rest against the shoulders in the jaw; and when the cap piece, which is removed in this cut, is replaced, the screw is held from moving endways.

PRICES.

No. 1 takes from ⅛ to ¾ inch Pipe	$ 3 00
No. 1½ takes from ⅜ to 1 inch Pipe	3 50
No. 2 takes from ½ to 1¼ inch Pipe	4 00
No. 3 takes from 1 to 2 inch Pipe	5 00
No. 4 takes from 1½ to 3 inch Pipe	9 00
No. 5 takes from 2½ to 4 inch Pipe	12 00

GAS PLYERS.



GAS PLYERS.

Size, inches	6	7	8	9	10	11	12	13
Price, Plain	$0 90	1 10	1 30	1 60	1 90	2 10	2 90	3 15
Price, Polished	1 15	1 30	1 50	1 80	2 10	2 30	3 10	3 35

PIPE TONGS,

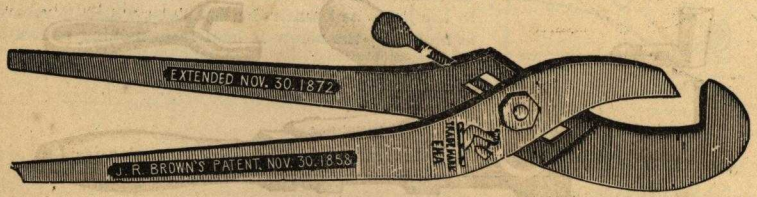
MADE EXTRA HEAVY AND STRONG.

PIPE TONGS,

MADE EXTRA HEAVY AND STRONG.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Price, each	$1 10	1 10	1 10	1 20	1 30	1 50	1 85	2 30	2 85	3 50	4 25	5 25	6 25	9 00	11 00

BROWN'S PATENT PIPE TONGS.

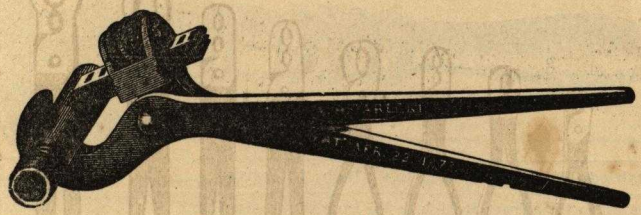


BROWN'S PATENT PIPE TONGS.

No. 1 Takes from ⅛ to ¼ inch Pipe	$3 00
No. 1½ Takes from ⅜ to 1 inch Pipe	3 50
No. 2 Takes from ¼ to 1¼ inch Pipe	4 00
No. 3 Takes from 1 to 2 inch Pipe	$5 00
No. 4 Takes from 1½ to 3 inch Pipe	9 00
No. 5 Takes from 2½ to 4 inch Pipe	12 00

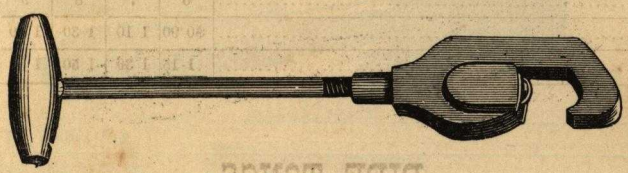
JARECKI'S ADJUSTABLE PIPE TONGS.

Received the only Medal awarded on Tongs at the Cincinnati Industrial Exposition, 1875.



No. 0 grips Gas Burner to ¾ inch	$3 00	No. 3 grips Gas Burner ⅛ to 2½ inch	$ 5 00
No. 1 grips Gas Burner to 1 inch	3 50	No. 4 grips Gas Burner ¾ to 3½ inch	9 00
No. 2 grips Gas Burner ¼ to 1½ inch	4 00	No. 5 grips Gas Burner 2½ to 6 inch	16 00

STANWOOD'S PATENT PIPE CUTTER.

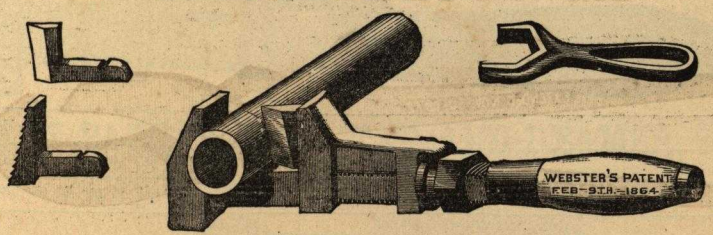


Number.	Cuts Pipe.	Retail Price, Case-Hardened.	Retail Price, Steel-Faced.
Number 1	⅛ to ¾ inches.	$ 3 00	$ 5 50
Number 2	1 to 2 inches	4 50	7 00
Number 3	2 to 3 inches.	14 00	18 00

CUTTER WHEELS.

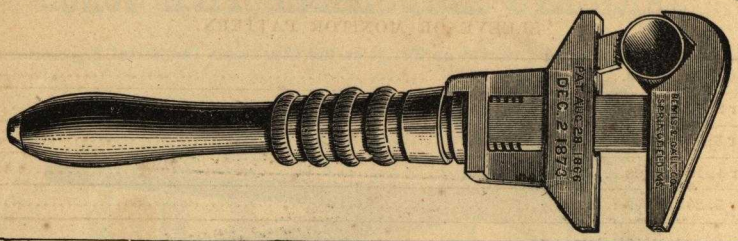
Number	1	2	3
Retail Price Cutter Wheels	$0 25	0 35	0 50

WEBSTER'S PATENT COMBINED WRENCH, PIPE WRENCH AND PIPE CUTTER.



12 inch, with Tools for Pipe, ⅛ to ¾, Price	$4 00
15 inch, with Tools for Pipe, ⅛ to 1½, Price	5 00
18 inch, with Tools for Pipe, ⅛ to 2 , Price	6 00
21 inch, with Tools for Pipe, ⅛ to 2½, Price	7 00

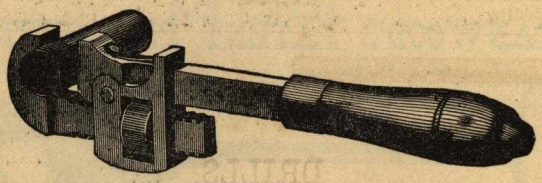
BEMIS & CALL'S GAS PIPE WRENCH, With Long Nut.



Bright, 10 inch, adjustable to Pipe from ½ inch to 1 inch, inclusive	$2 25
Bright, 12 inch, adjustable to Pipe from ½ inch to 1½ inch, inclusive	2 50
Bright, 15 inch, adjustable to Pipe from ½ inch to 2 inch, inclusive	3 50

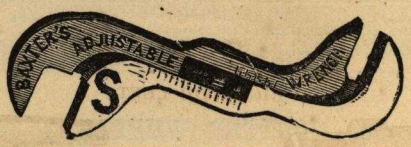
STILLSON'S PATENT WRENCH,

MADE OF THE BEST CAST STEEL



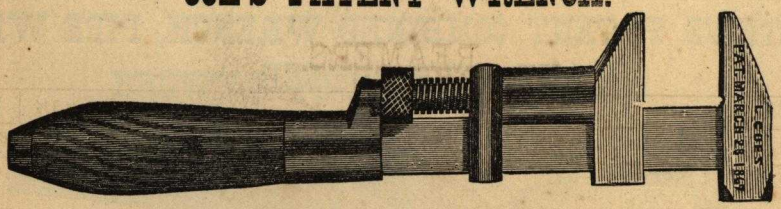
Size, inches	6	10	14	18	24	36	48
Price, each	$1 75	2 25	3 00	4 00	6 00	12 00	18 00

BAXTER'S PATENT ADJUSTABLE "S" WRENCH.



Size, inches	4	6	8	10	12	15
Price, each	0 50	0 75	1 00	1 50	2 00	2 50

COE'S PATENT WRENCH.



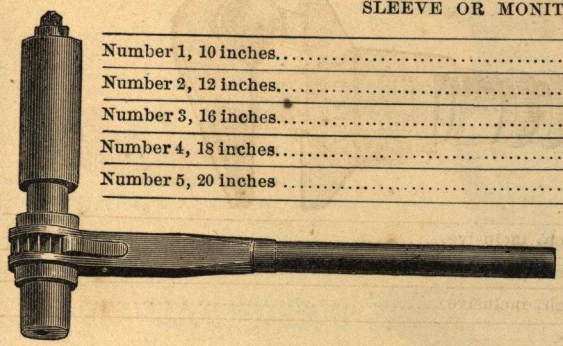
Size, inches	6	8	10	12	15	18	21
Price, Black	$9 00	10 00	12 00	14 00	24 00	30 00	36 00
Price, Bright	10 00	11 00	14 00	16 00	26 00	32 00	38 00

GIRARD AGRICULTURAL WRENCH.

Size, inches	8	10	12	15
Price, each	$10 00	12 00	14 00	24 00

RATCHET DRILLS,

SLEEVE OR MONITOR PATTERN.



Number 1, 10 inches	$10 50
Number 2, 12 inches	13 50
Number 3, 16 inches	16 00
Number 4, 18 inches	19 00
Number 5, 20 inches	24 00

BOILER RATCHET.

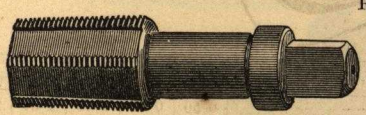
Number 1, Plain	$ 9 00
Number 2, Self-Feeding	10 50

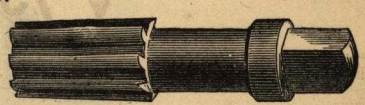
DRILLS.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2
Price, each	$1 00	1 10	1 15	1 20	1 30	1 50	1 75	2 00	2 50

TAPS,

RIGHT OR LEFT.





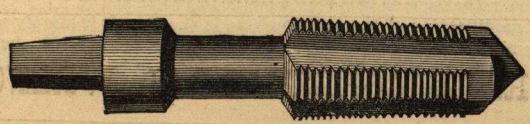
Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each	$1 12	1 25	1 50	1 87	2 50	3 12	3 75	4 62	6 25	10 50	15 00

REAMERS.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each	$1 12	1 25	1 50	1 87	2 50	3 12	3 75	4 62	6 25	10 50	15 00

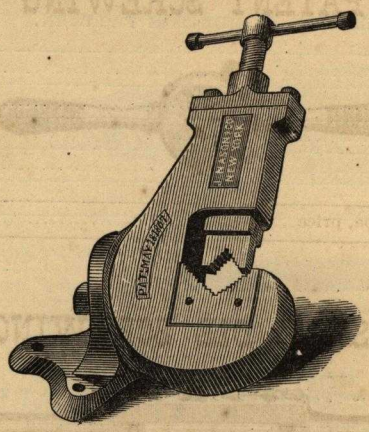
HUMPHREY'S PATENT DRILL TAP AND REAMER, COMBINED.

(Patented August 17, 1869.)



Size, inches	¼	⅜	½	¾	1	1¼	1½	2
Price, each	$3 50	3 50	4 00	6 00	7 00	8 50	10 00	12 00

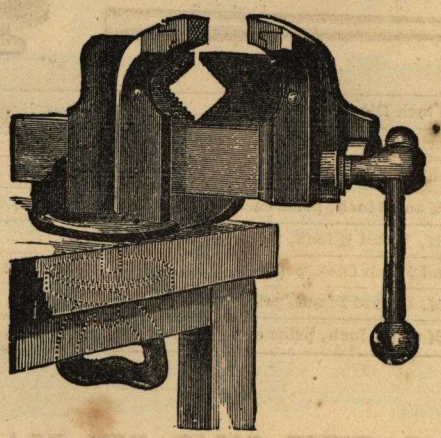
NASON'S PATENT PIPE VISE.



In the Pipe Vises hitherto in use, the jaws are so enclosed on all sides that the pipe can only be entered endwise, making it necessary to reserve the space beyond the Vise equal to the length of the longest pipe to be screwed. In the Improved Vise one side is open, admitting the pipe sidewise, and saving about half the room that would be otherwise required. This side opening is attended with the further advantages that the Vise may be used for holding pipes, while elbows, tees or other fittings are screwed upon one or both ends, or for taking apart old pipework in which the parts have become rusted together. This is not possible in Vises with enclosed jaws, as pipes with fittings upon their ends cannot be inserted or released. The movable or working parts of the Improved Vise are so arranged as to present the greatest strength and resistance to wear, and the greatest facility for repair or renewal, they are so carefully fitted by planing and turning.

Number 1, to hold from ⅛ to 1¼ inch pipe	$15 00
Number 2, to hold from ⅛ to 2 inch pipe	18 00
Number 3, to hold from ¼ to 3 inch pipe	30 00

SMITH'S IMPROVED COMBINATION PIPE VISE.

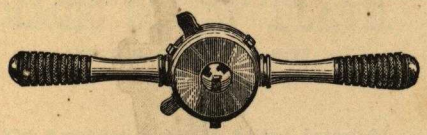


Gas Fitters, Plumbers and Metal Workers generally know how difficult it is to hold a pipe in a common vise with parallel jaws. The surfaces in contact are so small that the pipe is often squeezed somewhat flat before it will hold at all, and is always a source of annoyance. If a thread has to be cut on a large pipe, it is almost impossible to hold it without jamming or defacing it. The same is true where a pipe has to be cut off.

In this engraving a useful modification of the common Vise is shown. It is simply a set of dies, A and B, fastened to the Vise jaws by pins C, and sliding in each other. By this means the Vise can be used either for pipes or other common work. The jaws are serrated, as shown, and will take a pipe 3½ inches in diameter. These Vises can be swung around in any direction, being attached to a swivel bolt, as shown in cut.

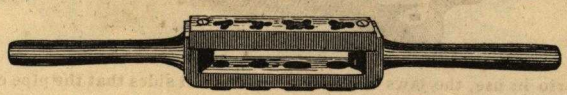
Number 1, to hold from ⅛ to 2 inch pipe	$16 00
Number 2, to hold from ⅛ to 3 inch pipe	20 00

GLEASON'S PATENT SCREWING STOCKS.



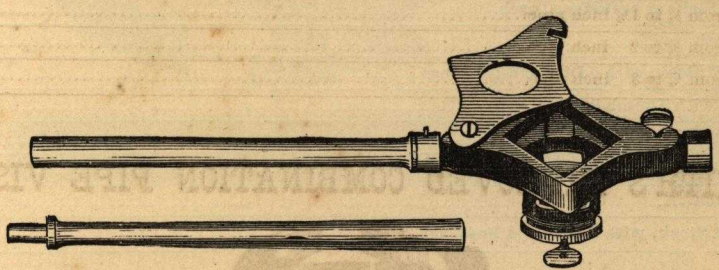
Cutting ⅜, ½, ⅝, ¾, ⅞ and 1 in. Brass Pipe, price	$15 00

SAUNDER'S SOLID DIE SCREWING STOCKS.



Screw Plate, for ⅛, ¼, ⅜ and ½ in. Pipe. (Needs no change of Dies or Guides.) All complete, with Dies	$10 00

L. M. RUMSEY MFG. CO.'S STOCKS AND DIES.



No. 1, Stock with ⅛, ¼, ⅜ and ½ inch Dies, price	$12 00
Size of Dies (2 x ½ inch), price each Die	1 75
No. 2, Stock with ¼, ⅜, ½, ¾ and 1 inch Dies, price	17 00
Size of Dies (3 x ¾ inch), ¾ and 1 inch, price each Die	2 75
Size of Dies (2 x ½ inch), ¼, ⅜ and ½ inch, price each Die	1 75
No. 3, Stock with ¾, 1, 1¼, 1½ and 2 inch Dies, price	30 75
Size of Dies (4 x 1 inch), 1¼, 1½ and 2 inch, price each Die	4 75
Size of Dies (3 x ¾ inch), ¾ and 1 inch, price each Die	2 75

WALWORTH'S PATENT SOLID DIE PLATES, AND HILL'S PATENT DIES.

No. 0 , Die Plates, with ⅛, ¼, ⅜ and ½ inch Dies.	(Size of Dies, 2 x ½ inch.)	Price	$ 9 50
No. 1 , Die Plates, with ¼, ⅜, ½, ¾ and 1 inch Dies.	(Size of Dies, 2½ x ¾ inch.)	Price	15 00
No. 1½, Die Plates, with ¾, 1 and 1¼ inch Dies.	(Size of Dies, 3 x ¾ inch.)	Price	13 50
No. 2 , Die Plates, with 1¼, 1½ and 2 inch Dies.	(Size of Dies, 4 x ⅞ inch.)	Price	20 00
No. 3 , Die Plates, with 2½ and 3 inch Dies.	(Size of Dies, 5 x1¼ inch.)	Price	43 00

ARMSTRONG'S IMPROVED ADJUSTABLE STOCK AND DIES,

FOR PIPE AND BOLTS.

(Patented April 6, 1875, and October 8, 1878.)

No. 1 Stock, each	$ 3 00
No. 1 Dies, either Right or Left Hand, each	1 25
No. 1 Bushings, each	0 25
Making price No. 1 Stock, with 4 Dies and Bushings	9 00
No. 2 Stock, each	3 50
No. 2 Dies, either Right or Left Hand, each	1 50
No. 2 Bushings, each	0 25
Making price No. 2 Stock, with 5 Dies and Bushings	12 00
No. 2 Long Guide, with Thumb Screws, each	0 50
No. 3 Stock, each	7 00
No. 3 Dies, either Right or Left Hand, each	4 00
No. 3 Bushings, each	0 50
Making price No. 3 Stock, with 3 Dies and Bushings	20 50

No. 1 Stock cuts ⅛, ¼, ⅜ and ½ inch Pipe, and ¼, 5-16, ⅜, 7-16, ½, ⅝ and ¾ inch Bolts.
No. 2 Stock cuts ⅛, ¼, ⅜, ½, ¾ and 1 inch Pipe, and ½, ⅝, ¾, ⅞, 1, 1⅛ and 1¼ inch Bolts
No. 3 Stock cuts 1¼, 1½ and 2 inch Pipe.

BOLT DIES,

FOR NO. 1 STOCK, CUTTING FROM ¼ TO ¾ INCH.

Size, inches	¼	5-16	⅜	7-16	½	⅝	¾
Price	$1 50	1 50	1 50	1 50	1 75	1 75	1 75

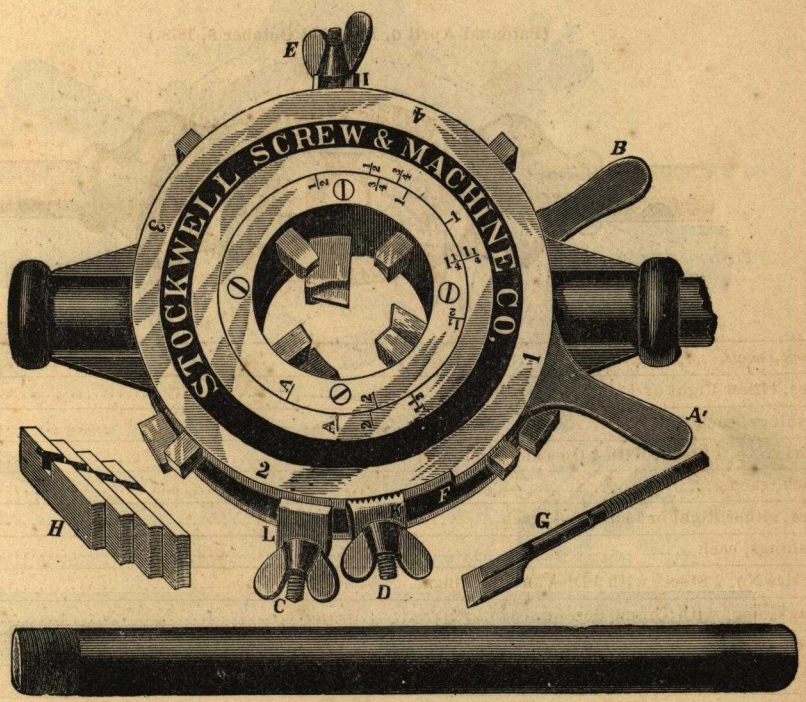
BOLT DIES,

FOR NO. 2 STOCK, CUTTING FROM ½ TO 1¼ INCH.

Size, Inches	½	⅝	¾	⅞	1	1⅛	1¼
Price	$2 00	2 00	2 25	2 25	2 25	2 50	2 50

Stock and any number of Dies, either Right or Left Hand, furnished at above prices.

MAGIC SCREW PLATE.



No. 3.

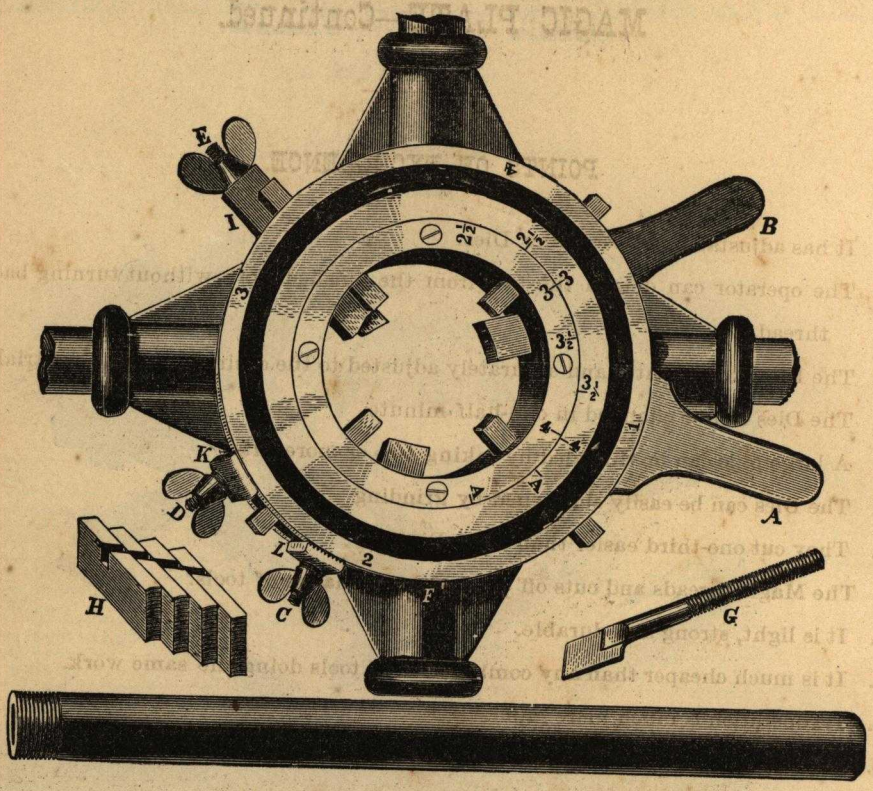
MAGIC SCREW PLATE.

For Steam and Gas Fitters, we make five sizes, cutting $\frac{1}{8}$ inch to 4 inches, with a PATENT CUT-OFF cutting off Pipe.

This is the most complete Hand Tool of which we have any knowledge. It cuts off and threads Pipe. Pipe Fitters, without steam power, will find the "MAGIC" much more convenient than the ordinary Hand Pipe Machines, as it is easily carried to the work to be done, and can be operated much more rapidly. Engine Builders will find them just the tools to send out with men for erecting work. We claim the MAGIC PLATE to be superior to any other Hand Tool in the market.

For points of excellence and prices, see page 255.

MAGIC SCREW PLATE—Continued.



No. 5.

MAGIC SCREW PLATE.

The above engraving is a very good representation of our No. 5 Magic, which cuts up to FOUR inches, and is the only practical Hand Tool in the market for cutting large sizes of Pipe and Tubing. This size does not differ from other sizes excepting that it has four handles.

EXPLANATION AND DIRECTIONS FOR USING.

B, Cam-plate operating Guides; A, Cam-plate operating Dies; I and G, Cut-off Tool; L and K are Stops for fastening Cam-plates; C and D, Thumb Nuts; H, Dies; Figs. 1, 2, 3 and 4 are stamped on plate, showing where Dies having corresponding numbers belong.

To thread say 3½ inch pipe, turn Cam-plate A till 3½ on it be opposite 3½ on inner circle; fasten with Thumb Nut C; slip the bolt or pipe through Guides, the end resting against the Dies; throw Guides against pipe, fasten with Nut D and proceed to cut thread. When done, throw Dies back from pipe and remove Tool. To change Dies, turn Cam-plate A till letter A on it be opposite A on inner circle, when the Dies will slip out. To use Cut-off, set Guides firmly against pipe, bring Cutter into action by Feed Screw E, setting up lightly at each turn of the Tool.

For Points of Excellence and Prices, see next page.

MAGIC PLATE—Continued.

POINTS OF EXCELLENCE.

1. It has adjustable self-centering Dies.
2. The operator can detach the tool from the finished work without turning back on the thread.
3. The Dies are instantly and accurately adjusted to the desired size without trial.
4. The Dies can be changed in one-half minute.
5. A large pipe can be threaded by taking two or more cuts.
6. The Dies can be easily sharpened by grinding.
7. They cut one-third easier than solid Dies.
8. The Magic threads and cuts off pipe without change of tools.
9. It is light, strong and durable.
10. It is much cheaper than any combination of tools doing the same work.
11. Its operation is much more rapid.
12. Each set of Dies cuts two sizes of pipe.
13. Threads can be cut over or under size to suit circumstances.

We manufacture five different sizes: Nos. 1, 2, 3, 4 and 5, with Patent Cut-off for pipe.

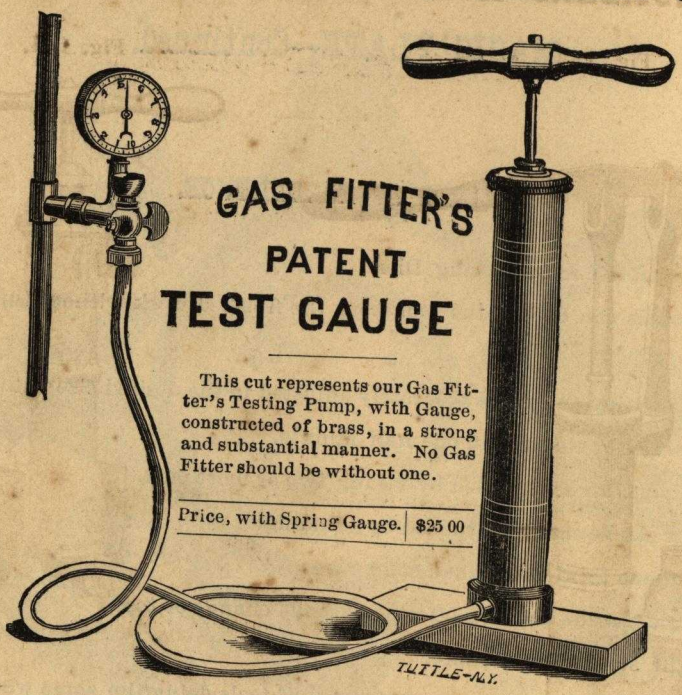
PRICE LIST OF MAGIC PLATE FOR PIPE.

No. 1, with Cut-off, and Dies for threading, ⅛, ¼, ⅜, ½ and ¾	$18 00
No. 2, with Cut-off, and Dies for threading, ¼, ⅜, ½, ¾, 1 and 1¼	20 00
No. 3, with Cut-off, and Dies for threading, ⅛, ¾, 1, 1¼, 1½ and 2	25 00
No. 4, with Cut-off, and Dies for threading, 1½, 2, 2½ and 3, with 4 Handles	35 00
No. 5, with Cut-off, and Dies for threading, 2½, 3, 3½ and 4, with 4 Handles	60 00

It will be seen that Nos. 1 and 3 make a complete set, cutting ⅛ to 2 inches, and Nos. 3 and 5 cut from ½ to 4 inches.

We also make two sizes designated A and B, with fixed handles and no cut-off, designed especially for Blacksmiths, Carriage Makers and Machinists. These are furnished in a case, with full set of Taps.

GAS FITTER'S PROVING PUMPS, WITH TEST GAUGE.



GAS COMPANY'S AND PLUMBER'S BRASS DRIP PUMPS.

Fig. 195.

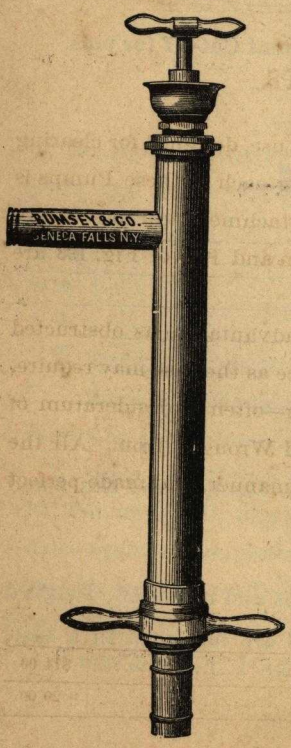
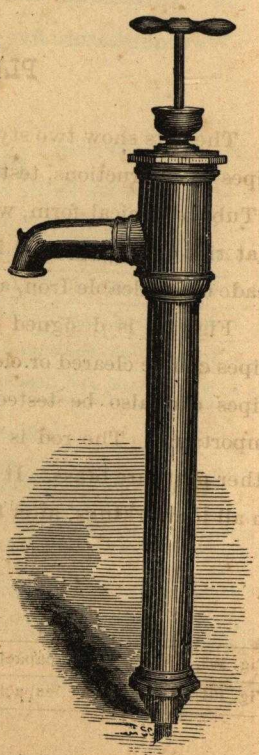


Fig. 195 shows our new Gas Drip Pump, admirably designed and constructed for all its purposes. The cylinder is 20 inch stroke, and made of brass with cap and stuffing box of same metal, and a solid brass rod. The spout passage being nearly as large as the cylinder, insures a free delivery of the drip. It works perfectly, excelling other Drip Pumps in several features, and needs only to be seen to secure a ready approval.

Fig. 330 shows a Brass Cylinder Suction Pump, also used for extracting the water from Gas Drips. It is substantially built, and Gas Companies, Plumbers and others will find it excellently adapted for their uses. We make it with 20 inch stroke.

Fig. 330.



SIZES, CAPACITY AND PRICES.

Fig. 195, all brass, 2 inch bore, capacity per stroke, ¼ gallon for ¾ or 1 inch pipe.....	$15 00
Fig. 330, brass cylinder, 2 inch bore, capacity per stroke, ¼ gallon for ¾ or 1 inch pipe....	12 00

PLUMBERS' HYDRAULIC PRESSURE PUMPS.

Fig. 193.

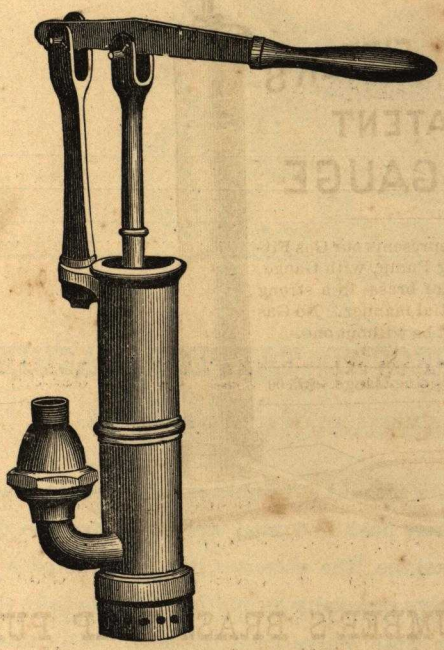
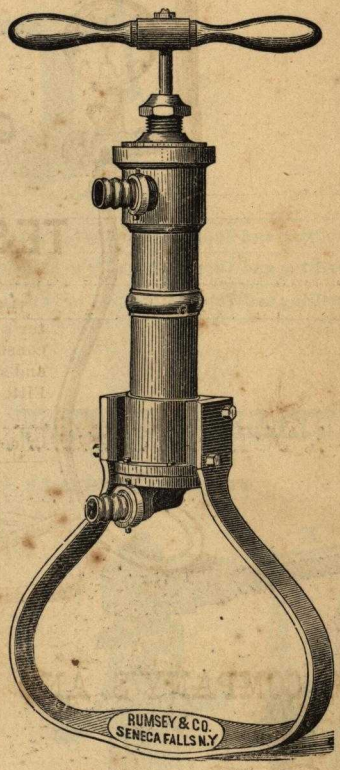


Fig. 194.



PLUMBERS' HYDRAULIC PRESSURE PUMPS.

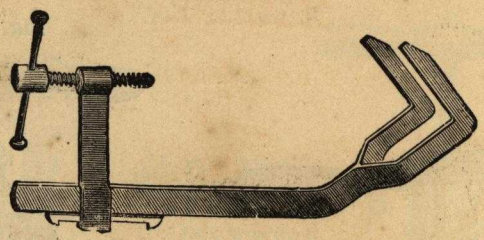
The cuts show two styles of our Brass Pressure Pumps for Plumbers' use, designed for clearing Pipes of obstructions, testing Water and Gas Pipes, etc. Accompanying each of these Pumps is a Tube of conical form, with a screw cut the whole length, fitted for attachment to Pipes of any material or size up to 1¼ inches internal diameter. The Lever, Fulcrum and Rod of Fig. 193 are made of Malleable Iron, and very strong and durable.

Fig. 194 is designed for the same uses as above, with additional advantages, as obstructed Pipes can be cleared or cleansed with this Pump either by suction or force as the case may require. Pipes can also be tested by means of exhaustion, instead of filling—often a desideratum of importance. The rod is of Solid Brass; the stirrup of the best forged Wrought Iron. All the other parts are brass. It is constructed in a skilled and workmanlike manner, and made perfect in all its workings, after the best scientific principles.

SIZES, CAPACITY AND PRICES.

Fig. 193, 2 in. Cylinder, capacity per Stroke 7-10 gallon, fitted for Hose	$14 00
Fig. 194, 2 in. Cylinder, capacity per Stroke 8-10 gallon, fitted for Hose or Iron Pipe	20 00

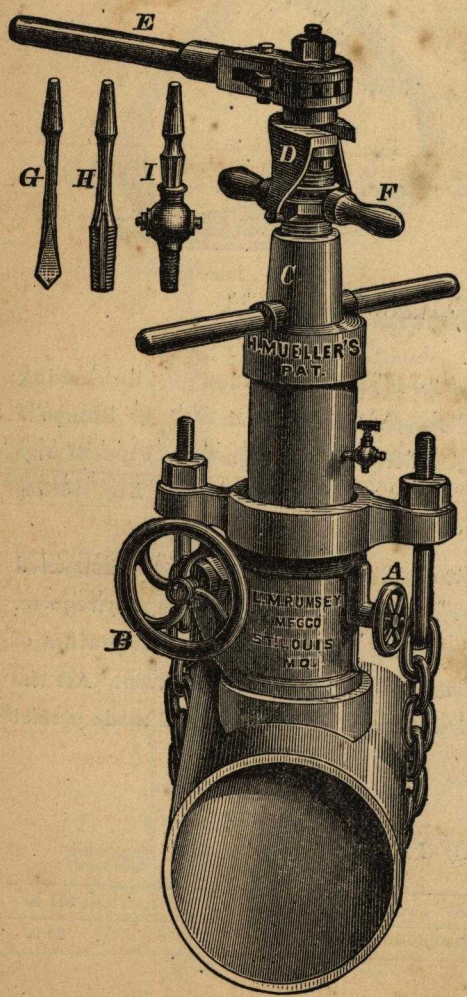
CROW FOR DRILLING AND TAPPING STREET MAINS.



No. 1, for Drilling and Tapping from 1½ to 3 inches	$10 00
No. 2, for Drilling and Tapping from 1¼ to 6 inches	13 00
No. 3, for Drilling and Tapping from 1¼ to 12 inches	16 00

MUELLER'S PATENT IMPROVED TAPPING MACHINE,

FOR TAPPING WATER AND GAS MAINS AGAINST ANY PRESSURE.



On account of trouble experienced, in places mostly where unskilled men were employed to operate the Machine, the patentee has constructed a new Flop Valve especially for his Machine, to take the place of the Gate Valve formerly used. With this improvement added, the Machine is complete, and can be operated by anybody and without any trouble.

You can tap on top and side of a Main, or you can give it any angle desired; having a ratchet drill, it requires less space, and is less liable to get out of order than any other Machine.

Each Machine is furnished complete with one of each ½, ⅝ and ¾ inch Drills, Taps and Plugs for Corporation Cocks, Chain and Wrench; also, 4 Saddles, 4 inch, 6 inch, 10 inch and 12 inch, will be sent, unless otherwise ordered.

In ordering a Machine, please always state the different sizes of Mains to be tapped, to enable us to send the right sizes of Saddles with the Machine, and avoid delay and trouble.

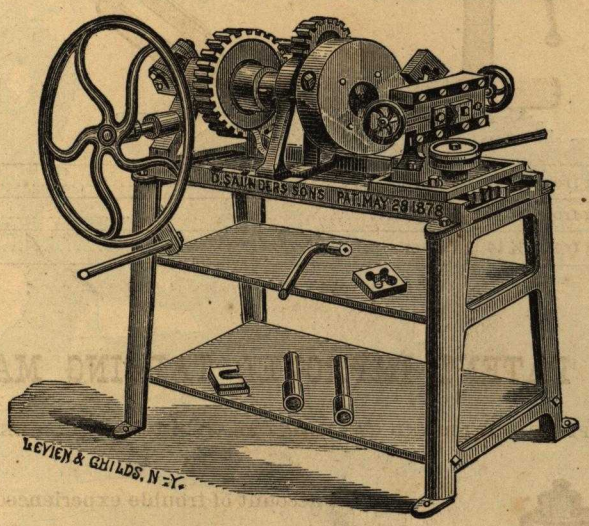
Full instructions for using go with every Machine, or will be furnished on application.

Warranted to give satisfaction.

Price	$100 00

SAUNDERS' NEW IMPROVED PIPE CUTTING AND THREADING MACHINE.

(The "I. X. L." Patented May 28, 1878.)



SIZES AND PRICES.

Hand Machine, with set of Dies ¼ to 2 inches, inclusive; Fly Wheel, and set of Sockets for making Nipples ¼ to 2 inches—complete	$150 00
Power and Hand Machine, with set of Dies ¼ to 2 inches, inclusive; Fly Wheel, Pulleys, Countershaft, and set of Sockets for making Nipples ¼ to 2 inches—complete	175 00

Speed of Countershaft, 200 revolutions per minute; Pulleys, 11 inches in diameter.

POWER PIPE MACHINES.

SIZES AND PRICES.

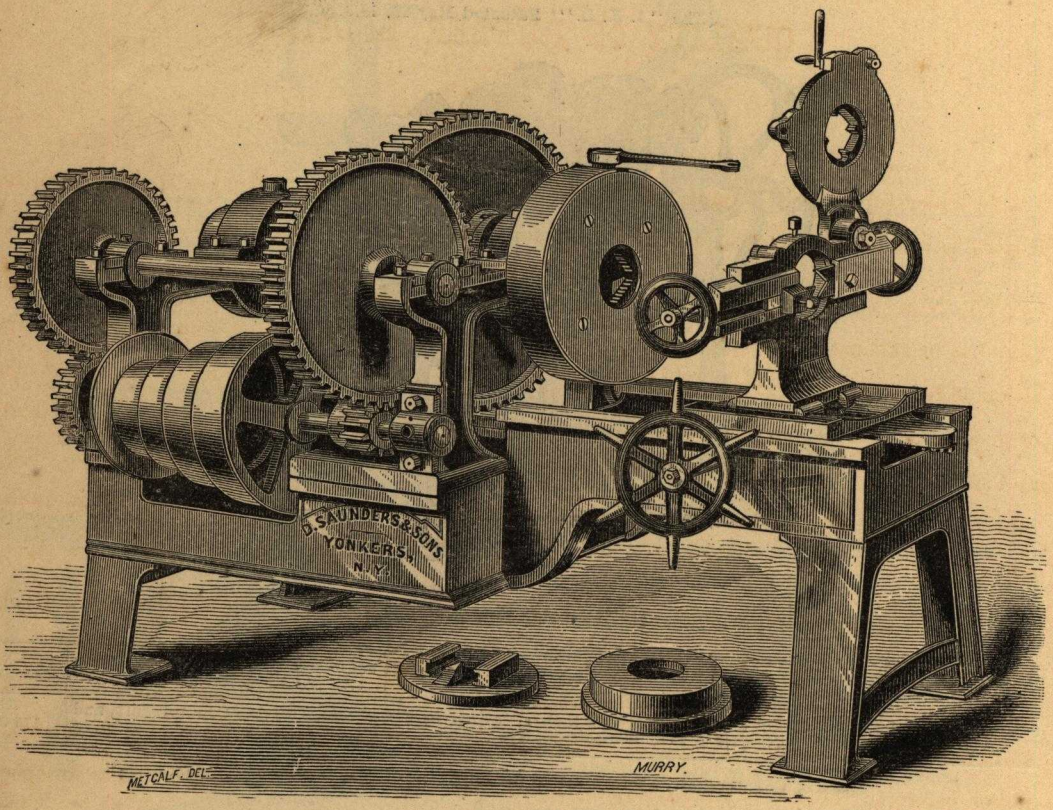
No. 2 screws and cuts off Pipe ¼ to 2 inches, with solid Dies, Countershaft and Bushings—complete	$275 00
No. 3 screws and cuts off Pipe ¼ to 3 inches, with Cutter Dies 2½ and 3 inches; Solid ¼ to 2 inches, Countershaft and Bushings—complete	400 00
No. 4 screws and cuts off Pipe 1 to 4 inches, with Cutter Dies 2½ to 4 inches; Solid 1 to 2 inches, Countershaft and Bushings—complete	500 00
No. 5 screws and cuts off Pipe 1¼ to 6 inches, with Solid Dies 1¼ to 2 inches; Cutter 2½ to 6 inches	800 00
No. 5, with Patent Dies 1¼ to 6 inches	1,000 00
No. 6 screws and cuts off Pipe 2½ to 8 inches, with Cutter Dies 2½ to 8 inches	1,050 00
No. 6 screws and cuts off Pipe 2½ to 8 inches, with Patent Dies 2½ to 8 inches	1,200 00

When these Machines—Nos. 2, 3 and 4—are made to work by hand as well as power, extra cost, $30.00.

SPEEDS OF COUNTERSHAFT.

No. 2—200 revolutions per minute; Pulleys, 11 inches in diameter.
No. 3—200 revolutions per minute; Pulleys, 14 inches in diameter.
No. 4—210 revolutions per minute; Pulleys, 14 inches in diameter.
No. 5—180 revolutions per minute; Pulleys, 16 inches in diameter.
No. 6—172 revolutions per minute; Pulleys, 16 inches in diameter.

SAUNDERS' IMPROVED MACHINES FOR SCREWING AND CUTTING OFF STEAM AND GAS PIPES.



This cut represents the No. 5 Machine, which screws and cuts off pipe from 1¼ to 6 inches. No. 6 is similar in style and arrangement. The advantages claimed for these Machines over others in use are:

1. The belting and gearing of the Machines have been arranged with the view of obtaining suitable power and speed for the various sizes of pipe, so that the small sizes of pipe will revolve the same number of feet per minute as the larger.

2. The power of the Machine is in the arrangement of the gearing, avoiding the necessity of using large pulleys and tight belts, a difficulty common in such Machines.

3. Besides the variations of speed obtained by the cone pulleys, two pair of gear wheels, which are very readily changed on the end of the frame, will give the required speed and power for the sizes to be cut.

4. The die and head to which it is attached are so constructed that pipe may be alternately screwed and cut off without removing the die from the Machine. The cutting off tool is convenient, and out of the way. The steel dogs, for steadying the pipe while cutting it off, are moved by a right and left screw, thereby centering the pipe truly. The dogs are adjustable, so as to compensate for wear.

5. The chuck for holding the pipe is strong and well fitted, and provided with independent dogs, permitting of the adjustment of the pipe to the centre, and avoiding a common difficulty in the ordinary pipe chuck after it has been used some time.

6. We have exercised great care in making the patterns for the gearing, which is cast from iron patterns, cut in the most approved shape of teeth, and we have thereby succeeded in making the Machines run almost noiselessly.

We also manufacture Patent Dies, which open so that the Die may be taken off the pipe without stopping or reversing the Machine.

For sizes and prices, see page 259.

QUALITY OF RUBBER BELTING.

In everything worth buying quality should be considered, but in Rubber Hose and Belting it is all important. We ask attention to the following:

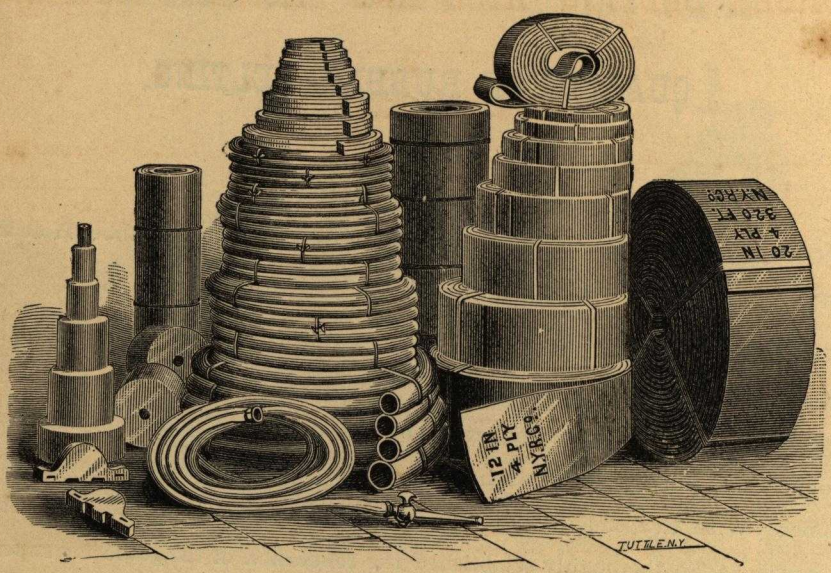
The New York Rubber Company was incorporated in 1851, thirty years ago, and in all this time has been constantly experimenting with the different materials which enter into the composition of Rubber Belting, Hose, Packing, etc.; not with the view of producing the cheapest class of goods, but for the purpose of furnishing those which will give satisfaction to both the dealer and consumer. With this end ever in view it has continued in the use of the same class of materials which has so thoroughly established the reputation of its goods for superior quality and excellence.

Cheapness of production, with a finish to please the eye, seems to be just now the aim of some manufacturers of these goods; but their use will prove that proper materials only will make serviceable goods, and when, added to such materials, there is the experience of many years in the combination of them, the question of which will continue to be inquired for is already settled, as never before in the life of that Company has it had so many orders from consumers for special lengths of Belting as at this time.

That Company also manufactures an extra heavy grade of Belting and Hose made on 32-oz. 42-inch Cotton Duck, which is marked and known as its "Premium Wiccapee" brand. This grade is superior to anything else ever produced, and stands without a rival. The Company's Standard Hose and Belting is made on 30-oz. 42-inch Duck, and is in quality the same as "Wiccapee," except that it is a shade lighter—the Duck being 30-oz. instead of 32-oz. In the production of both the grades of goods, only the best new India Rubber is used.

Making use of only the best material, employing only the most experienced labor, and being equipped with the latest improved machinery, the New York Rubber Company is prepared to do and does produce Rubber Hose and Belting full of merit, and which never fail to satisfy both dealers and consumers.

RUBBER BELTING, HOSE AND PACKING.



BELTING.

Made with 30-oz. 42-inch Cotton Duck, manufactured for us and expressly for the purpose. Full rolls measure 300 to 350 feet, but we cut them when desired.

TWO-PLY BELTING.

Size.	Per foot
1 inch	$0 07
1¼ inch	0 07
1½ inch	0 07
2 inch	0 15

Size.	Per foot.
2½ inch	$0 18
3 inch	0 22
3½ inch	0 26
4 inch	0 30

THREE-PLY BELTING.

Size.	Per foot.
1½ inch	$0 15
2 inch	0 17
2½ inch	0 22
3 inch	0 26
3½ inch	0 30
4 inch	0 34
4½ inch	0 39
5 inch	0 43
5½ inch	0 48
6 inch	0 52
7 inch	0 60
8 inch	0 70

Size.	Per foot.
9 inch	$0 80
10 inch	0 90
11 inch	1 00
12 inch	1 08
13 inch	1 18
14 inch	1 28
15 inch	1 38
16 inch	1 50
18 inch	1 70
20 inch	1 90
22 inch	2 12
24 inch	2 36

RUBBER BELTING, HOSE AND PACKING—Continued.

FOUR-PLY BELTING.

Sizes.	Per foot.
2 inch	$0 21
2½ inch	0 26
3 inch	0 31
3½ inch	0 37
4 inch	0 42
4½ inch	0 47
5 inch	0 52
5½ inch	0 57
6 inch	0 62
7 inch	0 73
8 inch	0 84
9 inch	0 95

Sizes.	Per foot.
10 inch	$1 07
11 inch	1 18
12 inch	1 30
13 inch	1 42
14 inch	1 54
15 inch	1 66
16 inch	1 78
18 inch	2 02
20 inch	2 26
22 inch	2 52
24 inch	2 80

Intermediate Widths, above 6 inches, made at proportionate prices. Heavy Five or Six-Ply Belts made to order at an advance of twenty-five and fifty per cent., respectively, on Four-Ply prices.

ENDLESS BELTS

Made to order, for which three extra feet will be charged for the splice, and ten per cent. additional on the net price of the whole Belt.

We have always in store a large stock of all widths of Two-Ply Belting up to 4 inches; of Three-Ply up to 12 inches; and of Four-Ply up to 18 inches, inclusive. Other wider sizes made to order at one week's notice.

DIRECTIONS FOR LACING AND USING RUBBER BELTING.

For narrow Belts, butt the two ends together, make two rows of holes in each end (thus obtaining double hold), and lace with lacing leather.

For wide belts, in addition, put a thin piece of leather or rubber on the back, to strengthen the joint, equal in length to the width of the belt, and sew or rivet it to the belt. The seam of the belt should always be on the inside.

In putting on the belting, it should be stretched as tightly as possible, and with wide belts this can be done best by the use of clamps secured firmly to each end of the belt, and drawn together by bolts running parallel with and outside the edges of the belt. There is no danger of breaking—as belt six inches wide and three-ply thick will stand a direct strain of five thousand pounds, and other sizes in proportion.

The belts will be greatly improved, and their durability increased, by putting on a composition with a painter's brush, and letting it dry, made of equal parts of Black Lead and Litharge, mixed with boiled Linseed Oil, and Japan enough to make it dry quick; the effect of this will be to produce a finely polished surface. Should the rubber from any cause get peeled off, a coat of the same composition may be applied. If the belt should slip, from dust or other causes—which seldom happens—it should be lightly moistened on the side next the pulley with coating of the above—animal oil will not answer. If one application does not produce the desired effect, repeat until it does.

RUBBER HOSE,

MADE WITH COTTON DUCK MANUFACTURED FOR US AND EXPRESSLY FOR THE PURPOSE.

TWO-PLY HOSE.

Inch.	Per Foot.	Inch.	Per Foot.
½	$ 0 20	2¼	$ 0 75
¾	0 25	2½	0 83
1	0 33	2¾	0 92
1¼	0 42	3	0 99
1½	0 50	3½	1 16
1¾	0 58	4	1 32
2	0 66		

This Hose is not calculated to stand much pressure, and is designed for conducting fluids only.

THREE-PLY HOSE.

Inch.	Per Foot.	Inch.	Per Foot.
½	$ 0 25	2¼	$ 0 90
¾	0 30	2½	1 00
1	0 40	2¾	1 10
1¼	0 50	3	1 20
1½	0 60	3½	1 40
1¾	0 70	4	1 60
2	0 80		

This Hose is made to stand a pressure of 100 lbs. to the square inch, and is suitable for Hydrants, Force Pumps, etc.

FOUR-PLY HOSE.

Inch.	Per Foot.	Inch.	Per Foot.
½	$ 0 30	2¼	$ 1 12
¾	0 37	2½	1 25
1	0 50	2¾	1 37
1¼	0 62	3	1 50
1½	0 75	3½	1 75
1¾	0 87	4	2 00
2	1 00		

The Four-Ply Hose is designed for Leading Hose for Hand Fire Engines and other purposes where the pressure is not greater than 150 lbs. to the square inch.

Five or Six-Ply Hose made to order at an advance of 25 and 50 per cent., respectively, on prices of Four-Ply.

All intermediate sizes to be charged at the list price of the next larger size; thus, ⅞ inch will be charged at one inch price, etc.

AIR-BRAKE HOSE.

This is Four-Ply Hose, made with extra care, especially for Air Brakes. It is used by all the principal roads in the United States, such as the Pennsylvania Central, Erie, New York Central, St. Louis and San Francisco, Missouri Pacific, Wabash, St. Louis and Pacific, Atchison, Topeka and Santa Fe, and others, and is giving the greatest satisfaction.

1 inch, inside diameter	83 cts. per ft.

The sizes indicated in the list are the inner diameters, and each size will FULLY measure what it is marked.

It is furnished in lengths of twenty-five and fifty feet, and THESE WE DO NOT CUT; but make to order on few days' notice; any lengths less than fifty feet of any size or strength required.

RUBBER HOSE.

STEAM HOSE.

THREE-PLY.

Int. Diam. Inch.	Per Foot.
½	$ 0 43
¾	0 51
1	0 67
1¼	0 85
1½	1 02
1¾	1 18
2	1 34
2½	1 66
3	2 00

FOUR-PLY.

Int. Diam. Inch.	Per Foot.
½	$ 0 51
¾	0 67
1	0 83
1¼	1 04
1½	1 25
1¾	1 45
2	1 66
2½	2 08
3	2 80

For conducting steam we make a superior quality of Hose, and keep in stock Four-Ply in sizes up to 1½ inches, for 35 pounds of steam or less. Other sizes and plies made to order. Wound with Marlin at ten per cent. net of list price additional.

BREWERS' FOUR-PLY HOSE.

Inch.	Per Foot.
¾	$ 0 67
1	0 83
1¼	1 04

Inch.	Per Foot.
1½	$ 1 25
1¾	1 45
2	1 66

This Hose is made expressly for Brewers' use; having extra thickness, will not kink, and has great strength and firmness.

SUCTION HOSE,

ON SPIRALLY WOUND GALVANIZED WIRE.

Int. Diam. Inch.	Per Foot.
¾	$ 0 70
1	0 90
1¼	1 15

Int. Diam. Inch.	Per Foot.
1½	$ 1 50
1¾	1 90
2	2 30

LARGE SUCTION HOSE,

ON GALVANIZED IRON SPIRAL WIRE.

Int. Diam. Inch.	Per Foot.
2½	$3 10
3	4 00
3½	4 90
4	5 80
4½	6 70
5	7 60
5½	8 50

Int. Diam. Inch.	Per Foot.
6	$ 9 50
7	12 00
8	15 00
9	17 50
10	20 00
11	22 50
12	25 00

We keep in stock up to 4 inches.

HARD RUBBER SUCTION HOSE,

WITHOUT SPIRAL OR BAND. WILL NOT COLLAPSE.

Inch.	Per Foot.
¾	$0 63
1	0 75
1¼	0 93
1½	1 13

Inch.	Per Foot.
1¾	$1 31
2	1 50
2½	1 88

Small sizes kept on hand and cut in any length, as required. Larger sizes made to order with two weeks' notice.

RUBBER TUBING,

IN LENGTHS OF TWELVE FEET.

PLAIN.

Int. Diam.	Per foot.
⅛ inch	$0 08
3-16 inch	0 12
¼ inch	0 16
5-16 inch	0 18
⅜ inch	0 20
½ inch	0 25
⅝ inch	0 30
¾ inch	0 35
1 inch	0 45

CLOTH INSERTION.

Int. Diam.	Per Foot.
⅛ inch	$0 10
3-16 inch	0 14
¼ inch	0 18
5-16 inch	0 20
⅜ inch	0 23
½ inch	0 28
⅝ inch	0 33
¾ inch	0 38
1 inch	0 50

RUBBBER VALVE BALLS.

Diam.	Per Doz.
1 inch or less	$1 00
1⅛ inch	1 40
1¼ inch	1 90
1⅜ inch	2 50
1½ inch	3 25
1⅝ inch	4 00
1¾ inch	4 75
1⅞ inch	5 50
2 inch	6 50
2¼ inch	8 00

Diam.	Per Doz.
2½ inch	$10 50
2¾ inch	13 00
3 inch	15 50
3¼ inch	19 50
3½ inch	23 50
3¾ inch	29 25
4 inch	35 00
4½ inch	54 50
5 inch	70 00
6 inch	115 00

We manufacture, to order, Valve Balls, harder or softer than the usual make, at special rates.

RUBBER-LINED LINEN HOSE.

(Made under Forsyth's Patent, Dated June 23, 1868.,

Int. Diam.	Per Foot.
1¼ inch	$0 75
1½ inch	0 88
1¾ inch	0 96
2 inch	1 10

Int. Diam.	Per Foot.
2¼ inch	$1 25
2½ inch	1 30
3 inch	1 60

The most practical Hose for use in Fire Departments, and pronounced by them to be the best Rubber-Lined Linen Hose now made. Warranted not to leak or sweat under a pressure of 300 pounds to the square inch.

RUBBER-LINED COTTON HOSE.

Int. Diam.	Per Foot.
¾ inch	$0 52

Int. Diam.	Per Foot.
1 inch	$0 60

UNLINED LINEN HOSE.

Int. Diam.	Per Foot.
¾ inch	$0 32
1 inch	0 36
1¼ inch	0 45
1½ inch	0 54
2 inch	0 70
2¼ inch	0 75
2½ inch	0 80
3 inch	0 90

Int. Diam.	Per Foot.
4 inch	$1 12
5 inch	1 35
6 inch	1 60
7 inch	2 00
8 inch	2 40
9 inch	2 80
10 inch	3 20

Seamless woven, and, consequently, able to withstand immense pressure. This Hose is used in Factories, Mills, Hotels and Steamboats all over the country.

COTTON HOSE, FOR RAILROAD TANKS.

Int. Diam.	Per Foot.
4 inch	$0 90
5 inch	1 05
6 inch	1 20
7 inch	1 50

Int. Diam.	Per Foot.
8 inch	$1 80
9 inch	2 10
10 inch	2 40

EUREKA "RED CROSS" SEAMLESS WOVEN AND RUBBER-LINED COTTON HOSE.

Int. Diam.	Per Foot.
¾ inch Garden Hose	$0 30
1 inch Garden Hose	0 40
1½ inch	0 60

Int. Diam.	Per Foot.
2 inch	$0 70
2½ inch	0 85

RUBBER PACKING.

STEAM PACKING,

CLOTH INSERTION—CLOTH ON ONE OR BOTH SIDES.

There is one-ply of cloth to every 1-16 inch thickness. Each cloth, whether insertion or on outside, to count as one-ply.

THICKNESS.	One-Ply, Per Pound.	Two-Ply, Per Pound.	Three-Ply, Per Pound.	Four-Ply, Per Pound.
1-64 inch	$0 70			
1-32 inch	0 65			
1-16 inch	0 60	0 65	0 66	
3-32 inch	0 55	0 58	0 61	
⅛ inch		0 55	0 58	0 61
3-16 inch			0 55	0 58
¼ inch				0 55

Three cents per pound additional will be charged for each extra ply of cloth. All Cloth Insertion Packing is one yard wide, and any length desired.

FIBROUS GASKETS OR RINGS.

Thickness, ⅛ inch or less, per pound	$0 90
Thickness, 5-32 inch and upwards, per pound	0 80

CLOTH INSERTION GASKETS OR RINGS.

Thickness, 1-16 inch, or less, per pound	$1 25
Thickness, 3-32 inch, and upwards, per pound	1 00

In all sizes above 3-32 there is one-ply of cloth to every 1-16 inch thickness. Each Cloth, whether insertion or on outside, to count as one-ply. Five cents per pound additional will be charged for each extra ply of cloth.

ROUND PISTON PACKING.

Made of Cotton Fabric and Rubber Core; from ¼ of an inch to 1½ inches diameter, and in lengths of 12 feet, per pound	$0 85

SQUARE PISTON PACKING.

Made of Cotton Fabric; from ¼ of an inch to 1½ inches square, and in lengths of 12 feet, per pound	$0 85

PURE SHEET RUBBER OR VALVE GUM.

Of superior quality, and all thicknesses, per pound	$1 40

PURE RUBBER VALVES, GASKETS, WASHERS, RINGS, ETC.

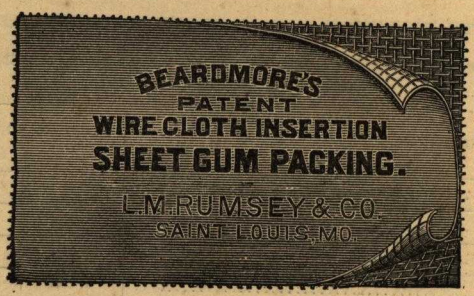
Per pound	$1 50

STEAM PACKING, ETC.

DESCRIPTION.	Per lb.
Hemp Packing, extra	$0 20
Hemp Packing, No. 1	0 16
Hemp Packing, No. 2	0 13
Hemp Packing, Italian	0 24
Soap Stone (Silver Lake) Packing	0 24

DESCRIPTION.	Per lb.
Soap Stone Packing, Miller's	$0 20
Cotton Rope Packing	0 44
Hemp Rope	Lowest Market Rates.
Manila Rope	
Sisal Rope	

BEARDMORE'S PATENT WIRE CLOTH INSERTION SHEET GUM PACKING.



ADVANTAGES OF WIRE CLOTH PACKING.

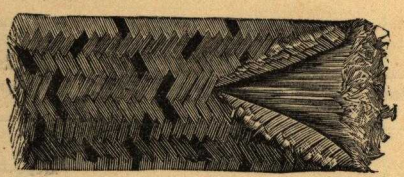
We believe an examination of this packing will convince every one who has had experience in the use of packing, of its decided superority over anything heretofore in use for the purpose. The insertion of wire cloth, while it destroys none of the elasticity so essential in good packing, but rather increases it, at the same time gives enormous lateral strength, which is so necessary to prevent the gum from oozing or slushing out under the heavy pressure of fluids or steam. Each separate mesh of the wire cloth acts as an independent basis of strength, to effectually prevent the sliding or displacement of the rubber, and to hold it rigidly in place. The slushing or sliding of the leather in plain gum and cloth insertion packing, making it necessary to break joints and re-pack at frequent intervals, is a sufficient argument in favor of wire cloth insertion. The great durability of the wire cloth insertion packing will be at once evident, and the economy of its use fully demonstrated by a trial.

The wire insertion packing has been thoroughly tested by many of the leading engineers of this country, and is pronounced superior to any packing they have ever used.

We can furnish packing of any thickness and plies.

Price, all thicknesses, per lb	$1 05

ASBESTOS GOODS.

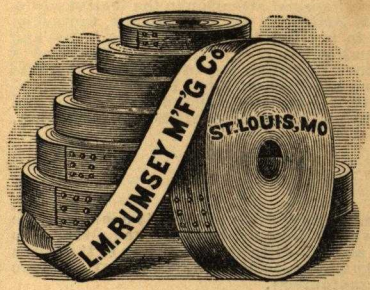


PRICE LIST.

Steam Rope Packing, per lb	$ 0 75
Refined Loose Fibre, per lb	0 50
Refined Loose Fibre (seconds), per lb	0 25
Journal Packing, per lb	0 20
Wick Packing, per lb	1 00
Mill Board, per lb	0 50
Sheathing Paper or Roll Mill Board, per lb	0 50
Flooring Felt, per lb	0 20
Cloth, per square yard	5 00
Hair Felt, first quality, ½ inch, per square foot	0 05
Hair Felt, first quality, ¾ inch, per square foot	0 06
Hair Felt, first quality, 1 inch, per square foot	0 07½

Gaskets cut to order, special prices. Boiler and Pipe Coverings, special prices.

LEATHER BELTING.



SELECTION OF BELTING.—Belts are now used almost exclusively for the transmission of power, and experience has demonstrated that, generally speaking, those made from well tanned, pure Oak Leather, properly stretched and carefully put together, are among the best for this purpose.

SPURIOUS LEATHER.—The majority of those using Belting have not had the opportunity of becoming good judges of Leather. This fact is taken advantage of by many, and a large number of Belts are manufactured and sold that are not what they are represented to be. Some are made from Hemlock Tanned Leather, colored to resemble Oak; some from Chemical Tanned Leather; others from Dry Hide Sole Leather.

The Leather is often cut full length of the hide without being stretched, or if not, it is stretched in the side and then cut, either way making a poor article of Belting.

Those who purchase of us may rest assured that they will obtain a Belt made from pure Oak Leather—tanned expressly for this purpose, and properly stretched—which we warrant to run truly on the pulley and to do good service.

LEATHER BELTING,

PATENT STRETCHED, OAK TANNED, CUT FROM SELECTED HIDES.

SIZE.	Per Foot.
1 inch	$0 09
1¼ inch	0 12
1½ inch	0 15
1¾ inch	0 18
2 inch	0 21
2¼ inch	0 24
2½ inch	0 27
2¾ inch	0 30
3 inch	0 33
3½ inch	0 39
4 inch	0 45
4½ inch	0 51
5 inch	0 57
5½ inch	0 63
6 inch	0 69
7 inch	0 81
8 inch	0 93
9 inch	1 05
10 inch	1 17
11 inch	1 29
12 inch	1 41

SIZE.	Per Foot.
13 inch	$1 53
14 inch	1 65
15 inch	1 80
16 inch	1 94
17 inch	2 10
18 inch	2 26
19 inch	2 42
20 inch	2 58
21 inch	2 74
22 inch	2 90
23 inch	3 06
24 inch	3 22
26 inch	3 56
28 inch	3 90
30 inch	4 22
32 inch	4 54
34 inch	4 86
36 inch	5 18
40 inch	5 82
44 inch	46
48 inch	7 10

DOUBLE LEATHER BELTING.

DOUBLE BELT. DOUBLE PRICE.

ROUND LEATHER BELTING.

SIZE.	Per Foot.
⅛ inch	$ 0 05
3-16 inch	0 09
¼ inch	0 12
5-16 inch	0 15
⅜ inch	0 20

SIZE.	Per Foot.
¼ inch	$0 25
⅝ inch	0 30
¾ inch	0 38
⅞ inch	0 45
1 inch	0 53

SHULTZ'S PATENT FULLED LEATHER BELTING,

LACE AND PICKER LEATHER.

In presenting this Circular and Price List to our patrons and the public, we call special attention to the testimonials, as they are from the largest and best known manufactories in the country. This Belting is made of leather, tanned on the surfaces only; the interior (which is the fibre and strength of the hide) is not tanned, but raw hide fulled and softened by our patented process. This Belting is more pliable, and hugs the pulley better, and transmits more power than any other Belt. It does not pull out at the Lace Holes or Rivets. It stretches less than any other Belt. It works equally well for the largest driving Belts, or for the fastest running machinery and smallest pulleys. Do not be deceived by the so-called "oil-dressed belting," which some also call "raw hide." It is only tanned leather soaked in oil, and a poor imitation of our goods. Our Lace Leather is made of raw hide, by our patent process, without any tanning, and is stronger and will wear better than any other.

SHULTZ'S BELT GREASE.

This Belt Grease will fill a want long felt. It is made from pure articles (no gum or rosin used). It contracts the fibres of the leather, thus making it tighter on the pulleys, fills up the pores and makes it adhere to the pulley, thus giving it more power. It also prevents dampness from affecting the Belting, and adds life and pliability to it, which makes it wear much longer. Use no rosin or any other injurious article to make the Belt adhere to the pulley, as none is needed when this Belt Grease is used. Send for trial package. Satisfaction guaranteed.

Put up in 10, 25 and 50 pound Tin Packages, Barrels and Half Barrels.

Price, per lb	$0 25

PRICE LIST OF SHULTZ'S RAW HIDE BELTING.

PER RUNNING FOOT.

Size.	Per Foot.
1 inch	$0 09
1¼ inch	0 12
1½ inch	0 15
1¾ inch	0 18
2 inch	0 21
2¼ inch	0 24
2½ inch	0 27
2¾ inch	0 30
3 inch	0 33
3½ inch	0 39
4 inch	0 45
4½ inch	0 51
5 inch	0 57
5½ inch	0 63
6 inch	0 69
7 inch	0 81
8 inch	0 93
9 inch	1 05
10 inch	1 17

Size.	Per Foot.
11 inch	$1 29
12 inch	1 41
13 inch	1 53
14 inch	1 65
15 inch	1 80
16 inch	1 94
17 inch	2 10
18 inch	2 26
19 inch	2 42
20 inch	2 58
21 inch	2 74
22 inch	2 90
24 inch	3 22
26 inch	3 56
28 inch	3 90
30 inch	4 22
36 inch	5 18
40 inch	5 82
48 inch	7 10

SHULTZ'S SOLID ROUND RAW HIDE BELTING.

⅛ inch, per foot	$0 05
3-16 inch, per foot	0 07
¼ inch, per foot	$0 10

Double Belts, twice the price of Single.

SHULTZ'S RAW HIDE SIDE LACE LEATHER.

Per square foot	$0 30

SHULTZ'S RAW HIDE CUT LACINGS.

¼ inch, per 100 feet	$1 10
5-16 inch, per 100 feet	1 35
⅜ inch, per 100 feet	1 65
½ inch, per 100 feet	$2 50
⅝ inch, per 100 feet	3 00
¾ inch, per 100 feet	3 50

LACE LEATHER.

PAGE'S LACE LEATHER.

Per lb., by the dozen sides	$0 80

CUT LEATHER LACING.

¼ inch, per 100 feet	$ 1 00	⅝ inch, per 100 feet	$ 2 75
⅜ inch, per 100 feet	1 50	¾ inch, per 100 feet	3 75
½ inch, per 100 feet	2 00		

RAW HIDE SIDE LACE LEATHER.

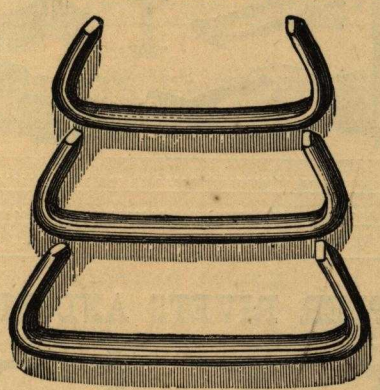
Per square foot	$0 30

RAW HIDE CUT LACING.

¼ inch, per 100 feet	$ 1 10	⅝ inch, per 100 feet	$ 3 00
⅜ inch, per 100 feet	1 65	¾ inch, per 100 feet	3 50
½ inch, per 100 feet	2 50		

We have always on hand a large stock of well selected Lace Leather, made from best hides and carefully tanned. In ordering Lace Leather in the side, state whether you want "Light," "Medium" or "Heavy" sides.

POINTED BELT HOOKS.



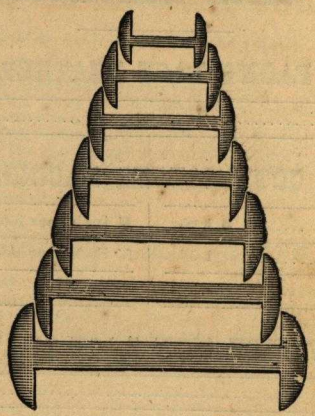
REVISED PRICE LIST—PER 1,000.

3 inch	$60 00	No. 8	$5 00
2½ inch	50 00	No. 9	4 00
No. 1	30 00	No. 10	3 50
No. 2	20 00	No. 11	3 00
No. 3	16 00	No. 12	2 80
No. 4	14 00	No. 13	2 60
No. 5	11 00	No. 14	2 40
No. 6	8 50	No. 15	2 00
No. 7	6 00		

BELT PUNCHES.

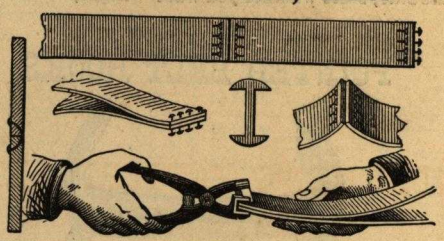
Numbers	5	6	7	8	9	10
Each	$0 20	0 25	0 25	0 30	0 35	0 40

PATENT BELT STUDS.



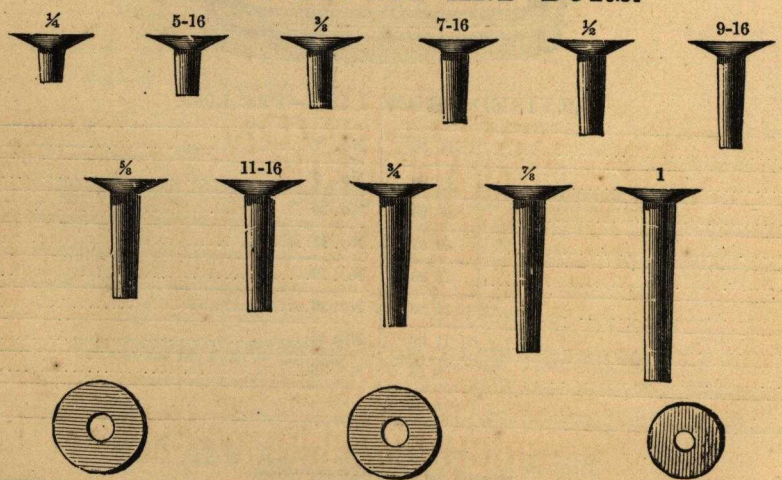
No. 00, per 100	$2 50
No. 0, per 100	2 00
No. 1, per 100	1 65
No. 2, per 100	1 25
No. 3, per 100	$0 90
No. 4, per 100	0 80
No. 5, per 100	0 70
No. 6, per 100	0 60

BELT CUTTERS, ETC.



Cutters for Rubber Belts	$1 25
Cutters for Leather Belts	0 90
Awls to spread the slit	0 25

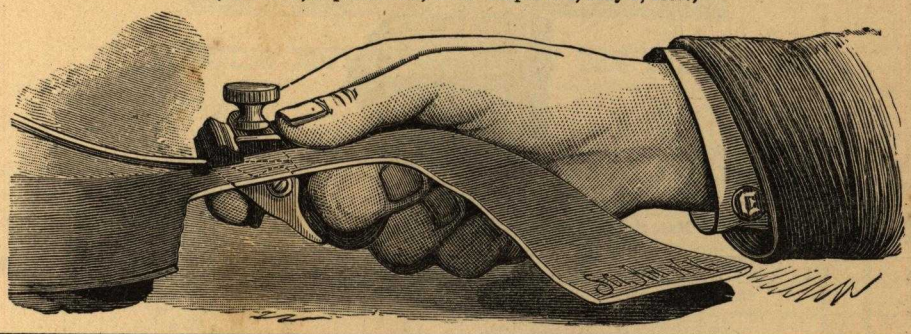
COPPER RIVETS AND BURS.



No. 7, Copper Rivets and Burs, per lb	$0 49
No. 8, Copper Rivets and Burs, per lb	0 50
No. 9, Copper Rivets and Burs, per lb	0 52
No. 10, Copper Rivets and Burs, per lb	$0 54
No. 12, Copper Rivets and Burs, per lb	0 58

ELLIOTT'S "1880" LACE CUTTER.

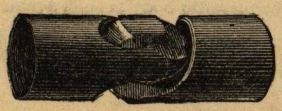
(Patented, September 3, 1878. Improved, May 1, 1880.)



Price, per doz	$6 00

ROUND STEEL BELT COUPLINGS,

FOR ROUND AND TWIST BELT.



Size, inches	⅛	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
Price, per doz	$2 00	2 00	2 00	2 50	3 00	3 50	4 00	5 00	6 00	9 00	13 00	18 00	22 00

FOUNDRYMEN'S PATTERN LETTERS.

ROMAN STYLE.

Size, inches	⅛	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½	2
Price	$0 03	0 03	0 03	0 04	0 05	0 05	0 05	0 06	0 06	0 07	0 07	0 08	0 10	0 12	0 15

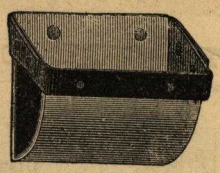
GOTHIC STYLE.

Size, inches	¼	5-16	⅜	½	⅝
Price	$0 03	0 04	0 04	0 04	0 05

One Pound Cans, per pound	$0 50
Five Pound Cans, per pound	0 45

We shall be pleased to send you sample for trial.

THE RIVET MILL BUCKET.



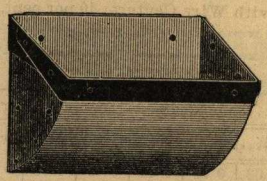
Across Belt.	Projection.	Material in Bodies and Bands.	Weight, Lbs.	Capacity.	Price List.
2½ x	2¼	Coke Tin, ⅝ inch, No. 22		¼ pint.	$0 05
3 x	3	" " ¾ " " 20		½ "	0 07
3½ x	3	" " 1 " " 20		⅚ "	0 08
4 x	3	" " 1 " " 20		⅔ "	0 09
4½ x	3½	" " 1 " " 18		1 "	0 10
5 x	4	Ref. Iron, No. 27, 1 " " 18		1½ "	0 12
5½ x	4	" " 1⅛ " " 16		1⅔ "	0 13
6 x	4	" " 1⅛ " " 16		1¾ "	0 15
7 x	4½	" " 1⅛ " " 16		2⅔ "	0 17

Odd sizes, 5 per cent. additional.

These Buckets are light, strong and durable, and of the latest and most approved pattern. The front has a beautiful and even curve (one-quarter of circle), with the lip suitably lowered to facilitate the emptying of the stuff. The sides are formed by a corrugation of the metallic body in such a manner, that, aided by the iron bands, gives great rigidity to the Bucket.

They are especially designed for, and are abundantly strong enough for any mill service, or similar work. They are made of bright new stock, and in large quantities, and are kept constantly on hand for the prompt filling of orders. They will be japanned for 5 per cent. in addition to regular figures.

PATENT EXCELSIOR RIVET BUCKET.

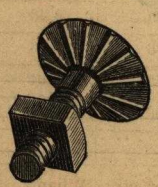


Across Belt.	Projection.	Material in Bodies and Bands, Refined Iron.	Weight, Lbs.	Capacity.	Price List.
5 x	4	No. 28, 1 inch, No. 16		1⅓ pts.	$0 16
5½ x	4	" 28, 1 " " 16		1⅔ "	0 17
6 x	4	" 27, 1⅛ " " 16		1¾ "	0 19
7 x	4½	" 27, 1⅛ " " 16		2⅔ "	0 21
8 x	5	" 27, 1¼ " " 15		3⅓ "	0 23
9 x	5	" 27, 1¼ " " 14		2 qts.	0 27
10 x	5½	" 27, 1¼ " " 14		3 "	0 31
11 x	6	" 26, 1¼ " " 14		3½ "	0 35
12 x	6	" 26, 1½ " " 14		4 "	0 38
14 x	6	" 26, 1½ " " 14		4½ "	0 42
16 x	6	" 26, 1½ " " 14		5 "	0 46
18 x	6	" 26, 1½ " " 14		6 "	0 50
20 x	6	" 26, 1½ " " 14		1 peck.	0 54

Odd sizes, 5 per cent. additional. Japanned, 5 per cent. extra.

These Buckets are exceedingly strong and well proportioned, without being too weighty. The front of the Bucket, at the point where the wear is the greatest, is protected by a guard of band iron in a most effective manner. The ends are double, and put together with strong rivets, from which these Buckets derive their name. They are suitable for any service in mill or warehouse. All sizes constantly in stock, or made on short notice.

THE CORRUGATED BELT BOLT.



1 x ¼ inch, per 100	$1 25
¾ x ¼ inch, per 100	1 00
½ x ¼ inch, per 100	1 00

TABLE AND PRICE LIST OF WIRE ROPE.

WIRE ROPE

HOISTING ROPE, 19 WIRES TO THE STRAND.

IRON WIRE ROPE.

Diameter	Breaking Strain in tons of 2,000 lbs.	Min. Size. of Drum or Sheave, in feet.	Price per foot, in cts.
⅜ inch	2.12	1¼	$0 09
½ inch	3 60	1½	0 10
9-16 inch	4.40	1¾	0 13
⅝ inch	5.33	2	0 14
¾ inch	8.75	2½	0 17
⅞ inch	11.66	2¾	0 21
1 inch	16.00	3	0 25
1⅛ inch	20.00	3½	0 32
1¼ inch	26.50	4	0 37
1⅜ inch	35.00	4½	0 46
1⅝ inch	44.00	5	0 58
1¾ inch	53 00	6	0 70
2 inch	63.00	7	0 84
2¼ inch	74.00	8	1 10
2½ inch	88.00	9	1 38

STEEL WIRE ROPE.

Diameter.	Breaking Strain in tons of 2,000 lbs.	Min. Size of Drum or Sheave, in feet.	Price per foot, in cts.
½ inch	4.5	2¼	$0 17
9-16 inch	5.5	2¾	0 19
⅝ inch	7.5	3	0 22
¾ inch	13	3½	0 25
⅞ inch	19	3¾	0 31
1 inch	24	4	0 37
1⅛ inch	30	4½	0 45
1¼ inch	39	5	0 55
1⅜ inch	52	5½	0 72
1⅝ inch	64	6	0 90
1¾ inch	78	7½	1 10
2 inch	92	8	1 28
2¼ inch	107	9	1 65

NOTE.—On Rope ordered with Wire Centers, 10 per cent. additional will be charged.

TILLER ROPES.

⅜ inch, per foot	$0 12
½ inch, per foot	0 14
⅝ inch, per foot	$0 18
¾ inch, per foot	0 24

ROPE, WITH 7 WIRES TO THE STRAND.

IRON WIRE ROPE.

Diameter.	Breaking Strain in tons of 2,000 lbs.	Price per foot, in cts.
9-32 inch	1.33	$0 04
5-16 inch	1.66	0 04½
⅜ inch	2.15	0 05
7-16 inch	2.90	0 06
½ inch	4.00	0 07
9-16 inch	4.66	0 09
⅝ inch	5.87	0 11
11-16 inch	7.50	0 14
¾ inch	9.00	0 16
⅞ inch	12.30	0 19
1 inch	16.00	0 23
1⅛ inch	20.00	0 27
1¼ inch	25.00	0 32
1⅜ inch	30.00	0 38
1½ inch	36 00	0 44

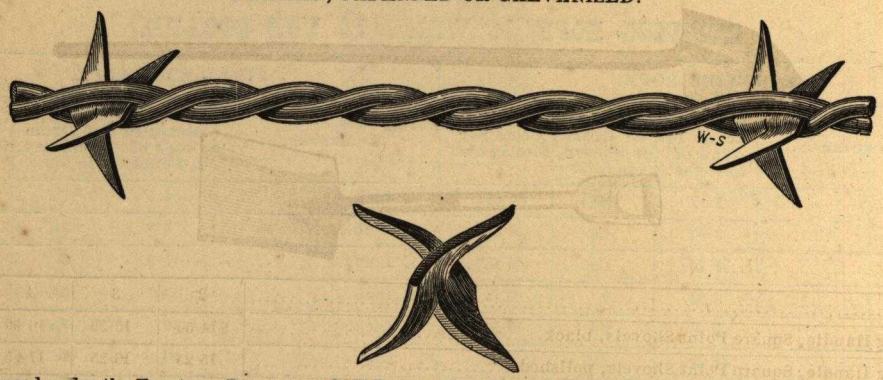
STEEL WIRE ROPE.

Diameter.	Breaking Strain in tons of 2,000 lbs.	Price per foot, in cts.
5-16 inch	2½	$0 06
⅜ inch	3¼	0 08
7-16 inch	4½	0 08½
½ inch	5½	0 09
9-16 inch	7	0 12
⅝ inch	8½	0 15
11-16 inch	11	0 18
¾ inch	14	0 22
⅞ inch	18	0 28
1 inch	23	0 36
1⅛ inch	29	0 43
1¼ inch	36	0 53
1⅜ inch	43	0 64
1½ inch	50	0 74

N. B.—These Ropes are best adapted for Guys, Standing Ropes, Ferries, Transmission of Power, etc. When using these Ropes for hoisting purposes, take very large winding drums and sheaves.

FRENTRESS STEEL BARBED WIRE,

PAINTED, JAPANNED OR GALVANIZED.

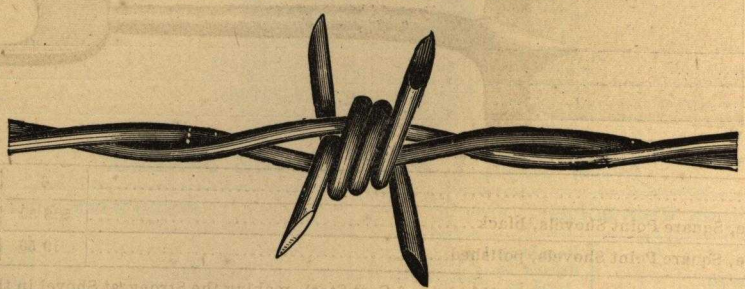


Licensed under the Frentress Patents, and all Bottom Patents on Barbed Wire. The most popular Barbed Fence Wire now offered in market at prices which cannot be undersold.

Painted or Japanned, in 10 ton lots, per lb	
Painted or Japanned, in 5 ton and less than 10 ton lots, per lb	
Painted or Japanned, in lots less than 5 tons, per lb	
Galvanized Barbed Fencing, advance, per lb	

MOHAWK STEEL BARBED WIRE FENCING,

PAINTED, JAPANNED OR GALVANIZED.



Painted or Japanned, in 10 ton lots, per lb	
Painted or Japanned, in 5 ton and less than 10 ton lots, per lb	
Painted or Japanned, in lots less than 5 tons, per lb	
Galvanized Barbed Fencing, advance, per lb	

FENCE AND TRELLIS WIRE.

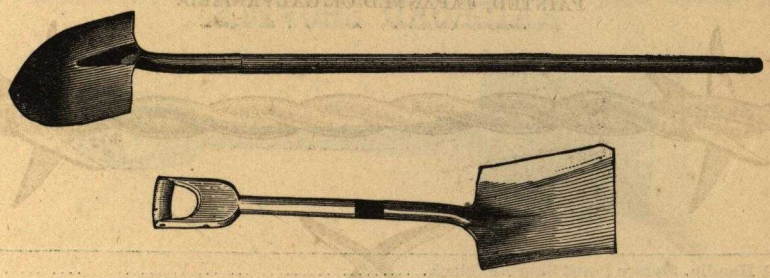
Fence Wire, No. 7	In car lots, net		Less than car lots, net
" No. 8			
" No. 9			
Trellis Wire, No. 10	In car lots, net		Less than car lots, net
" No. 11			
" No. 12	In car lots, net		Less than car lots, net
" No. 12			

SELF-CLINCHING FENCE STAPLES.

In Keg lots, per lb	
In less than Keg lots, per lb	

Write for prices.

REMINGTON'S SOLID CAST STEEL SHOVELS, SPADES AND SCOOPS.



Number	2	3	4	5
D or Long Handle, Square Point Shovels, black	$14 50	15 50	16 50	17 50
D or Long Handle, Square Point Shovels, polished	15 25	16 25	17 25	18 25
D or Long Handle, Round Point Slovels, black	15 00	16 00	17 00	
D or Long Handle, Round Point Shovels, polished	15 75	16 75	17 75	
D or Long Handle, Square Point Spades, polished	16 50	17 00		
D or Long Handle, Square Point Spades, black	15 50	16 00		

Blade and Socket made from one solid plate of Cast Steel, making the Strongest Shovel in the World.

REMINGTON'S SOLID CAST STEEL COAL SHOVELS.

Number	6	7	8
D or Long Handle, Square Point Shovels, black	$18 50	19 50	20 50
D or Long Handle, Square Point Shovels, polished	19 50	20 75	22 00

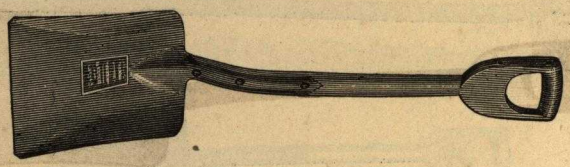
Blade and Socket made from one solid plate of Cast Steel, making the Strongest Shovel in the World.

REMINGTON'S PATENT SOLID CAST STEEL LOCOMOTIVE OR CHARGING SCOOPS.

Number	3	4	5
Locomotive Scoops	$17 50	18 25	19 50

Made like the Shovels from solid plate of best Cast Steel, Blade and Socket in one piece.

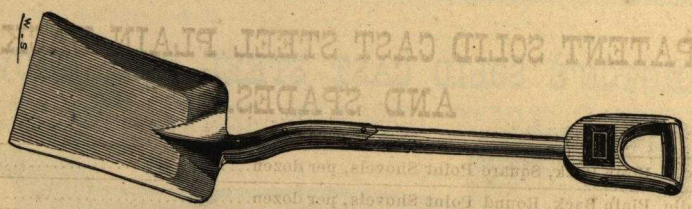
GROOM SHOVEL CO.'S PATENT HAMMERED SOLID CAST STEEL RAILROAD SHOVELS.



No. 2, Long or D Handle, Square Point Shovels, black	$11 00
No. 4, Long or D Handle, Square Point Shovels, black	12 00
No. 2, Long or D Handle, Square Point Shovels, polished	12 00
No. 4, Long or D Handle, Square Point Shovels, polished	13 00

Polished Shovels are boxed and sharpened. Black Shovels sharpened for Macadam or Railroad Work.

P W. GROOM'S SOLID CAST STEEL SHOVELS AND SPADES.



Plain Back, No. 2, Black, D Handle, Square Point Shovels, per dozen	$9 25
Plain Back, No. 2, Black, D Handle, Round Point Shovels, per dozen	9 75
Plain Back, No. 2, Black, L Handle, Square Point Shovels, per dozen	9 25
Plain Back, No. 2, Black, L Handle, Round Point Shovels, per dozen	9 25
Plain Back, No. 2, Black, Long or D Handle, Square Point Spades, per dozen	9 25

Polished, 75 cents per dozen extra.

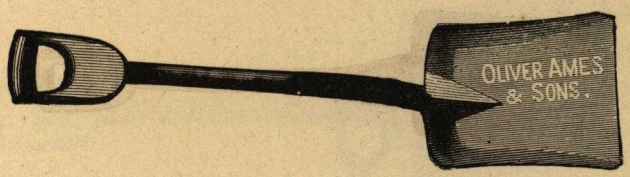
CHAMPION SOLID CAST STEEL SHOVELS AND SPADES.

No. 2, D Handle, Square Point Black Shovels, per dozen	$11 50
No. 2, D Handle, Square Point Polished Shovels, per dozen	12 50
No. 2, D Handle, Square Point Polished Spades, per dozen	12 50
No. 2, D Handle, Square Point Black Spades, per dozen	11 50

D Handle, Round Point Shovels, 50 cents per dozen extra.

The entire Blade and Strap are solid Cast Steel, and the steel Strap is annealed so as to be strong and tough. Every Blade is carefully tempered, and is in reality an Edged Tool.

O. AMES' CAST STEEL EDGE PLATED SHOVELS AND SPADES.



Number 2, Black, D Handle, Plain Back, Square Point Shovels, per dozen	$11 25
Number 2, Black, D Handle, Plain Back, Round Point Shovels, per dozen	11 50
Number 2, Black, Long Handle, Plain Back, Square Point Shovels, per dozen	11 25
Number 2, Black, Long Handle, Plain Back, Round Point Shovels, per dozen	11 25
Number 2, Black, Long or D Handle, Plain Back, Square Point Spades, per dozen	12 25

Polished, $1.00 per dozen extra.

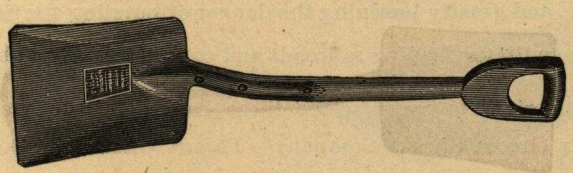
O. AMES' PATENT SOLID CAST STEEL PLAIN BACK SHOVELS AND SPADES.

No. 2, Black, D Handle, Plain Back, Square Point Shovels, per dozen	$12 75
No. 2, Black, D Handle, Plain Back, Round Point Shovels, per dozen	13 50
No. 2, Black, Long Handle, Plain Back, Square Point Shovels, per dozen	12 75
No. 2, Black, Long Handle, Plain Back, Round Point Shovels, per dozen	12 75
No. 2, Black, Long or D Handle, Plain Back, Square Point Spades, per dozen	12 75

Polished, $1.00 per dozen extra.

O. AMES' CAST STEEL EDGE PLATED SHOVELS AND SPADES.

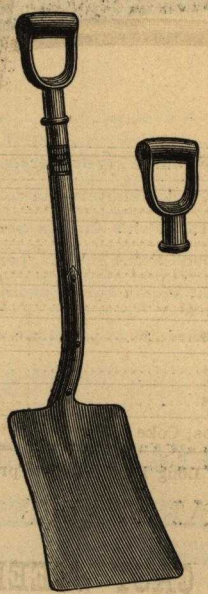
L. M. RUMSEY MFG. CO.'S SPECIAL.



No. 2, Black, D Handle, Plain Back, Square Point Shovels, per dozen	$11 25
No. 2, Black, D Handle, Plain Back, Round Point Shovels, per dozen	11 50
No. 2, Black, Long Handle, Plain Back, Square Point Shovels, per dozen	11 25
No. 2, Black, Long Handle, Plain Back, Round Point Shovels, per dozen	11 25
No. 2, Black, Long or D Handle, Plain Back, Square Point Spades, per dozen	12 25

Polished, $1.00 per dozen extra.

TAMPING SHOVELS.



TAMPING SHOVELS.

Strong and durable, possessing an improvement over the ordinary Solid Metal D Tops, by the use of an oval-shaped wooden block to fill out the inner part of the handle, which furnishes a surface for the grasp of the fingers, much preferable to metal in both cold and warm weather.

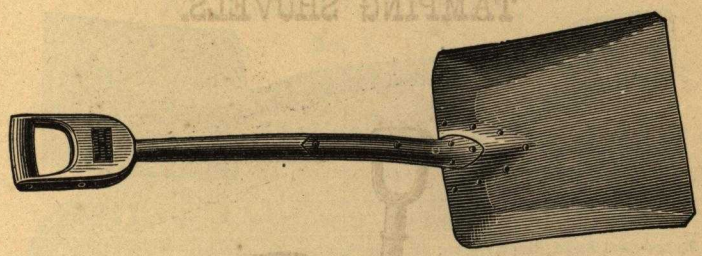
The Socket for handle is closed at the upper end, thus holding the handle firmly in place when used as a tamper, and greatly lessening the danger of bursting the Socket. These Tops are coming into general use with the leading railroads and contractors throughout the United States.

Having secured the right to manufacture these Patent D Tops, we are now prepared to furnish them with our Groom Shovel Company's Patent Hammered Solid Cast Steel Shovels for Railroad and Macadam use.

Price Bolton & Johnson Tamping Shovels, O. Ames', per doz	$14 50
Price Shaw's Tamping Shovel, O. Ames', per doz	14 50
Price Linley's Patent Tamping Shovel, Groom Shovel Company, per doz	14 50

GROOM'S EXTRA CAST STEEL COAL SHOVELS,

BACK STRAP. PITTSBURG PATTERN.



NUMBER.	Black.	Half Pol.
No. 1, D Handle Shovels	$ 9 50	$10 00
No. 2, D Handle Shovels	10 00	10 50
No. 3, D Handle Shovels	11 00	11 50
No. 4, D Handle Shovels, Coke	15 50	16 00
No. 1, D Handle Shovels, Sunken Back Straps	10 50	11 00
No. 2, D Handle Shovels, Sunken Back Straps	11 00	11 50
No. 3, D Handle Shovels, Sunken Back Straps	12 00	12 50
No. 4, D Handle Shovels, Sunken Back Straps, Coke	16 50	17 00

Long Handle, same price.

P. W. GROOM'S CAST STEEL COAL SHOVELS,

BACK STRAP. PITTSBURG PATTERN.

NUMBER.	Black.	Half Pol.
No. 1, D Handle Shovels	$ 8 50	$ 9 00
No. 2, D Handle Shovels	9 00	9 50
No. 3, D Handle Shovels	10 00	10 50

Long Handle, same price.

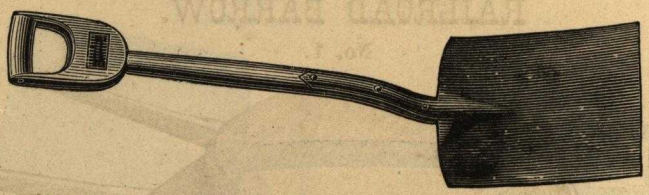
GROOM'S LOCOMOTIVE COAL AND GAS SCOOPS,

EXTRA HEAVY BLADES AND STRAPS.

NUMBER.	Black.	Half Pol.
No. 2, D Handle, Extra Cast Steel	$10 50	$10 75
No. 3, D Handle, Extra Cast Steel	11 00	11 25
No. 4, D Handle, Extra Cast Steel	11 50	11 75
No. 5, D Handle, Extra Cast Steel	12 00	12 25
No. 6, D Handle, Extra Cast Steel	12 50	12 75
No. 7, D Handle, Extra Cast Steel	13 00	13 25

MOULDER'S SHOVELS.

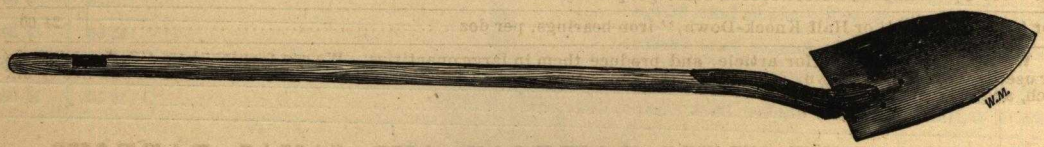
No. 2.



D Handle, Polished, Patent Solid Cast Steel, Plain Back, Moulder's Shovels, per doz	$12 00
D Handle, Polished, Extra Cast Steel, Back Strap, Moulder's Shovels, per doz	8 50

ROUND POINT CAST STEEL MINING SHOVELS,

BACK STRAPPED, POLISHED.



HALF SPRING POINT SHOVELS,

LONG HANDLE, BACK STRAP, POLISHED.

Groom Shovel Company, Extra Cast Steel, per doz	$11 25
P. W. Groom Cast Steel, per doz	9 75
Nicholson Best Steel, per doz	9 00

D Handle, 50 cents per dozen.

FULL SPRING POINT SHOVELS,

LONG HANDLE, BACK STRAP, POLISHED.

Groom Shovel Company, Extra Cast Steel, per doz	$11 25
P. W. Groom Cast Steel, per doz	9 75
Nicholson Best Steel, per doz	9 00

D Handle, 50 cents per dozen extra. Any of above, with Patent Socket Straps.....cents per dozen extra.

JOPLIN BACK STRAP CAST STEEL SLUICE AND MINING SHOVELS.

Long or D Handle, Stiff, Polished, per doz	$10 50
Long or D Handle, Full Spring, Polished, per doz	10 50
Long or D Handle, Half Spring, Polished per doz	10 50

J. THORN ROUND POINT STEEL MINING SHOVELS,

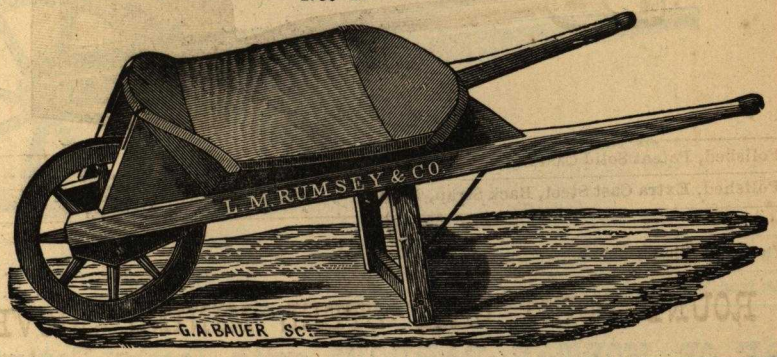
BACK STRAP, No. 2, FULL POLISHED.

Long Handle, Stiff Point, per doz	$8 50
D Handle, Stiff Point, per doz	9 00

WHEELBARROWS.

RAILROAD BARROW.

No. 1.

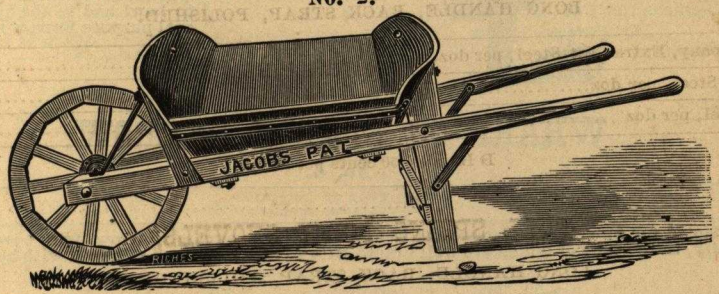


For "Set-Up" Railroad Barrows, iron bearings, per doz	$24 00
For "Knock-Down" or Half Knock-Down," iron bearings, per doz	24 00

We are making a superior article, and produce them in large quantities. We can furnish them "Set-up" ready for use. "Half Knock-Down," legs in boxes and wheels tied in bundles. "Knock-Down," trays in bundles of six each, and balance of parts boxed.

PATENT SELF-OILING RAILROAD AND CANAL BARROW.

No. 2.

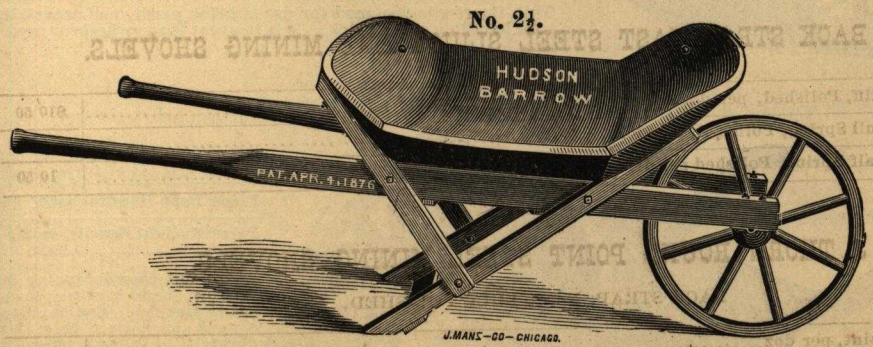


Price, per doz	$30 00

In ordering, please state whether shipment is to be "Knocked-Down" or "Set-Up." "Knock-Down" and baled in half dozen lots.

THE HUDSON BARROW.

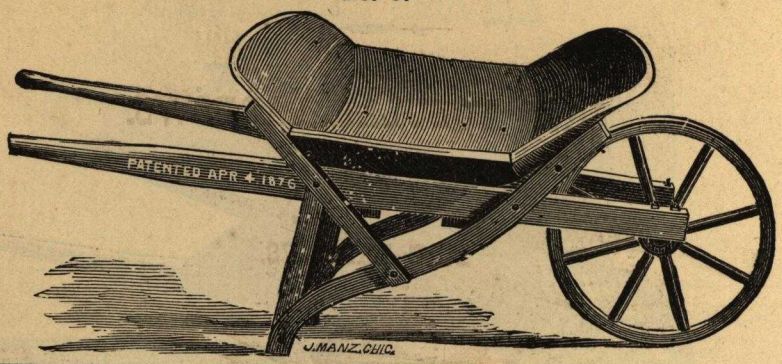
No. 2½.



Price, with Wood Wheel, per doz	$30 00
Price, with Iron Wheel, per doz	36 00

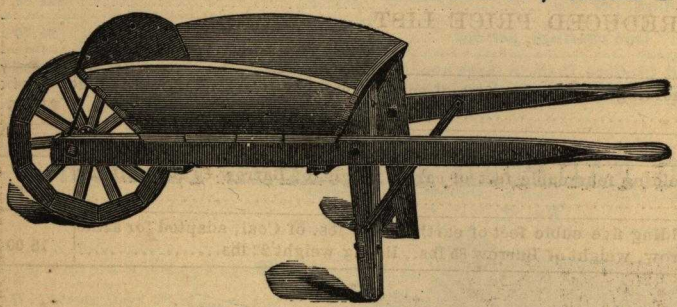
CENTENNIAL WHEELBARROW.

No. 3.



Price, with Wood Wheel, per doz	$36 00
Price, with Iron Wheel, per doz	38 00

ORE OR MORTAR BARROW, with Jacobs' Patent Wheel.



No. 4.

Price, each	$4 00

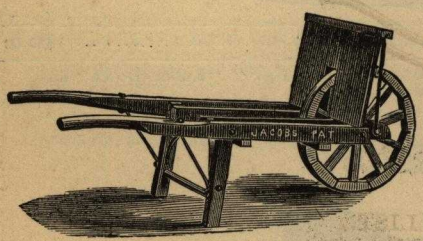
For Ore, Coal, Sand or Dirt. All hard wood. The sides and end pieces of bowl being dovetailed together, and firmly nailed, cannot come apart. The legs extend upwards as a brace to the bowl, and are bolted to bowl and to the handles. The best general purpose Barrow made.

WHARF OR STABLE BARROW.

No. 5.

Price, each	$4 50

Especially adapted for Saw Dust, Manure and Ashes. Similar to our Oar Barrow, with bowl of much greater capacity, the corners of which are well braced with extra cleats, and strapped with heavy iron.



Off-Bearing or Green Brick Barrow,

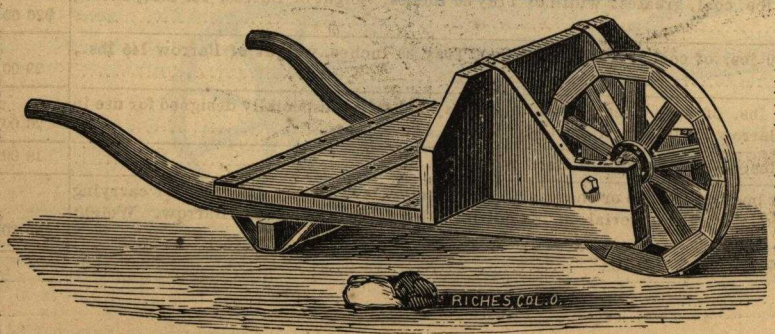
WITH JACOBS' PATENT WHEEL.

No. 6.

Price, each	$8 00

This Barrow is designed for use at brick yards, and especially for handling green brick. It is in great favor wherever used.

STONE BARROW.



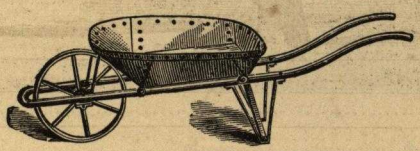
No. 7.

Price Bent Handle, each	$5 00
Price Straight Handle, each	4 75

This cut represents our Stone Barrow, made low in order to be easily worked. The handles are curved and built with a view of durability; it has a patent self-oiling wheel, strongly ironed, bed cross strapped, and is the best in the market

IRON TUBULAR BARROWS.

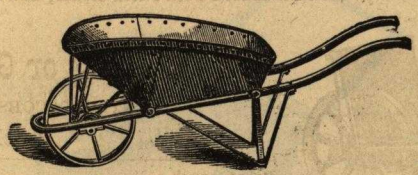
DIRT BARROWS.



REDUCED PRICE LIST.

No. 4, with Tray, made of No. 16 Iron, holding three cubic feet of earth, weight of Barrow 70 lbs., lifting weight 20 lbs	$10 75
No. 4½, with Tray, made of No. 14 Iron, same size as No 4, weight of Barrow 70 lbs., lifting weight 22 lbs	11 50
No. 5, with Tray, made of No. 14 Iron, holding four cubic feet of earth, weight of Barrow 80 lbs., lifting weight 21 lbs	13 50
No. 6, with Tray, made of No. 14 Iron, holding five cubic feet of earth, or 425 lbs. of Coal, adapted for same use as No. 5, and as a small Coal Barrow, weight of Barrow 85 lbs., lifting weight 22 lbs	15 00

COAL BARROWS.

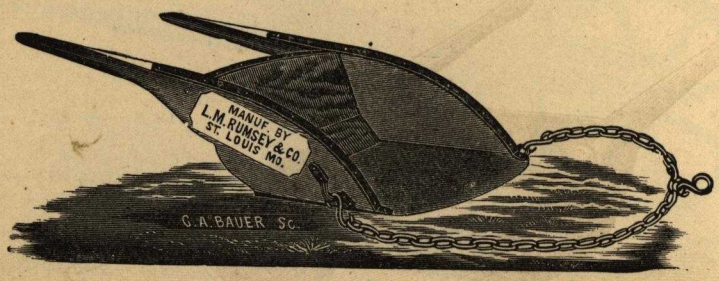


REDUCED PRICE LIST.

Size A, with Tray, holding 325 lbs. coal, greatest width of Tray 30 inches, weight of Barrow 135 lbs., lifting weight 28 lbs	$26 00
Size B, with Tray, holding 400 lbs. of coal, greatest width of Tray 36 inches, weight of Barrow 145 lbs., lifting weight 36 lbs	29 00
Size C, with Tray, holding 260 lbs. of coal, greatest width of Tray 25 inches, especially designed for use in coal bunkers, weight of Barrow 135 lbs., lifting weight 31 lbs	26 00
Size D, with Tray, holding 300 lbs. of coal, weight of Barrow 98 lbs	18 00
Size E, with Tray, holding four bushels of coke or charcoal. This Barrow is expressly designed for carrying coke, charcoal or other equally light material, and is not intended for use as a Coal Barrow. Weight of Barrow 126 lbs	28 00

ROAD SCRAPERS,

HAVE POLISHED STEEL BOTTOMS, WROUGHT EARS, VERY STRONGLY IRONED. THE BEST MADE.



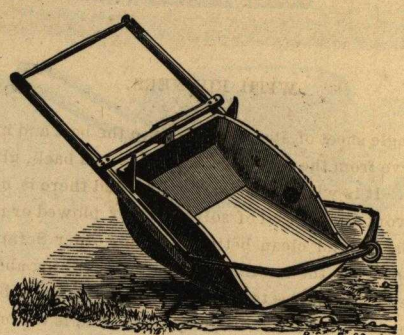
ROAD SCRAPERS,

HAVE POLISHED STEEL BOTTOMS, WROUGHT EARS, VERY STRONGLY IRONED. THE BEST MADE.

Steel Bottom, 34 inches, with Chain Bail, Round or Square Point	$13 00
Steel Bottom, 32 inches, with Chain Bail, Round or Square Point	12 50
Steel Bottom, 30 inches, with Chain Bail, Round or Square Point	12 00
28 inch, Cast Iron	9 00
26 inch, Cast Iron	8 50

DOTY'S "AUTOMATIC" REVOLVING SCRAPER,

IRON AND STEEL BOTTOMS.



DOTY'S "AUTOMATIC" REVOLVING SCRAPER,

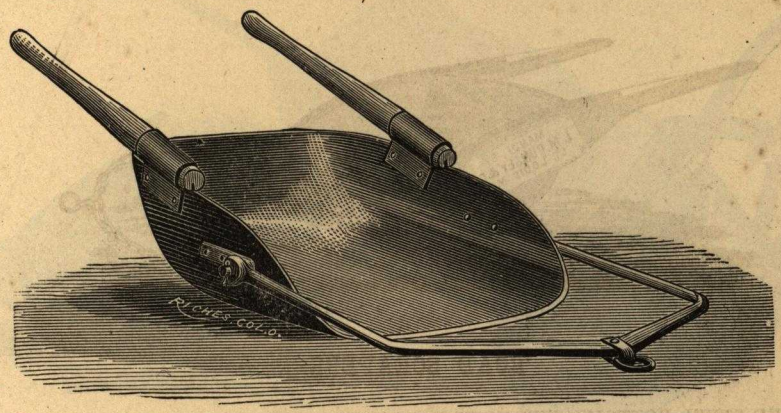
IRON AND STEEL BOTTOMS.

30 inch, Iron Bottoms, each	$16 50
30 inch, Steel Bottoms, each	18 00
33 inch, Steel Bottoms, each	19 00
36 inch, Steel Bottoms, each	20 00

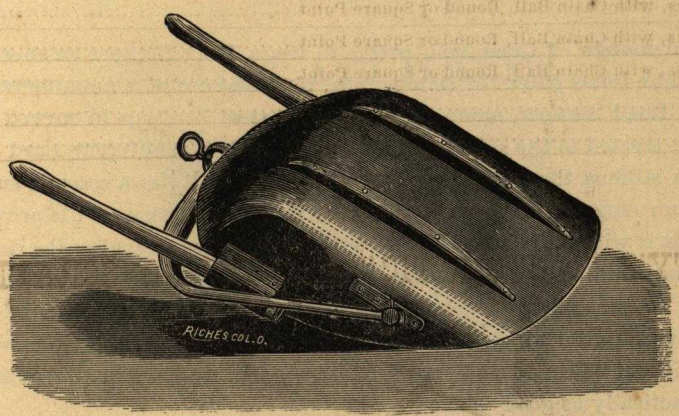
Shipped either knocked-down or set-up ready for use.

THE "COLUMBUS," OR "MOHAWK," SOLID STEEL SCRAPER.

(Patented November 4th, 1879.)



WITHOUT RUNNERS.



WITH RUNNERS.

This Perfect Scraper, made of a single sheet of steel, pressed into the best and most practical shape for working.

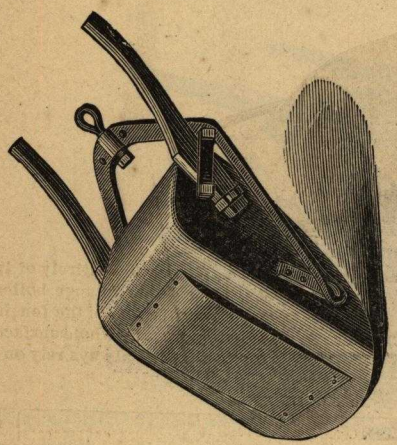
It is made with one continuous curve from the centre up the sides and back, giving it greater strength and capacity than can be obtained in any other way. It is without joint or seam, and there is no sharp corner, angle, bolt, brace or stay-rod about the Scraper. It will work in any kind of soil, whether plowed or not, and enters the ground as readily as a plow. We guarantee it to fill easier and clean better than any other Scraper, and it will scour where no other Scraper will. It is not injured by exposure to the weather, and there is nothing about it to get out of repair.

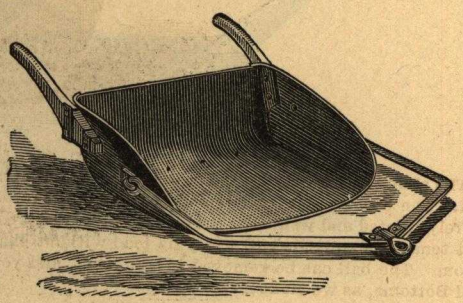
The new style Handles will commend themselves to every one, as they can, if broken, be easily replaced anywhere. The entire Bowl of the Scraper is made of one sheet of heavy steel, and is the only one so made. All other Scrapers represented as made of one sheet of steel have the old wood back, with sharp corners and stay-rods, bolts and braces, which are constantly getting out of repair. It is the lightest, strongest and most durable, and will displace all others wherever it is known. We make three sizes of this Scraper.

No. 1, carries 7 feet of earth, large size, and used for long haul or on down grade	$15 00
No. 2, carries 5 feet of earth, medium size, and is the best size for all ordinary railroad grading, ditch, farm or road work	14 00
No. 3, carries 3 feet of earth, and is intended for work on narrow ditch, with one horse	13 00

We furnish these Scrapers with Heavy Stiff Bail, unless specially ordered with Chain. Furnished with Steel Laid Soles or Runners, when specially ordered, $1 00 extra. In ordering these Scrapers, give name "Columbus," or "Mohawk," to distinguish from other Scrapers manufactured by us.

STUBBS-JONAS PATENT ALL STEEL BOTTOM ROAD SCRAPERS.





To meet the demands of those who prefer to use a Drag Scraper on short hauls, we have purchased the Stubbs-Jonas patent of October 5th, 1880, and are now manufacturing an all Steel Double Bottomed Road Scraper, made of one piece of steel bent up in curved lines at the sides and back, the back riveted to the sides. An extra 3-16 inch plate of very hard steel is riveted to the bottom, which stiffens the box, takes the wear, and as it has a smooth surface, and scours prevents the bottom clogging with dirt, thus reducing the friction. It is provided with a bail made strong so that it will not bend or spring, with a swivel for attaching the draft which admits of the Scraper being dumped sidewise when desired. All Scrapers are punched and drilled by the same pattern, so that extra bottom plates with necessary rivets can be furnished when ordered, which any one used to handling a hammer can rivet on (when from wear it is desirable to replace one) without taking the Scraper off the work, and when the new plate is on, the Scraper will be practically as good as new.

The wooden handles are securely fastened by a new and superior device which holds them immovable, and the rear ends are curved to prevent their catching in the ground when dumped and carrying empty.

We claim it is superior to all other Common Road or Drag Scrapers, for the following reasons:

1st. It is more durable. Nothing about it can be broken by use, and the extra bottom which takes the wear can be replaced at slight expense, which will make practically a new Scraper.

2d. While it fills as easily and as full as any, it loses less dirt.

3d. It can be dumped sidewise, which is a great advantage in finishing off banks.

4th. It is lighter draft, the load being carried on a hard, smooth, scoured surface of less width than the bottom of an ordinary Scraper.

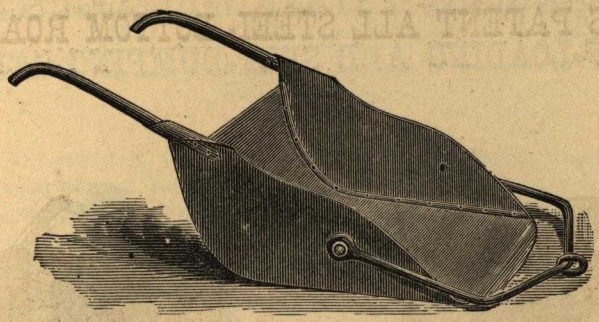
5th. It is less dangerous to the teams drawing it—the curves in the handles and swivel combined prevents turning over and striking the legs or the heels of the animals attached.

6th. It holds more than any of the Scrapers advertised to contain 5 cubic feet.

Its superiority over all other Drag Scrapers without any exception whatever, will be admitted by all on sight, and a thorough trial will establish it and remove all doubt.

No. 1, Capacity, 5 cubic feet; weight 105 lbs.	$14 00

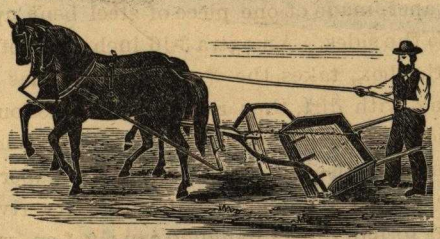
HUBER STEEL DUMP SCRAPER.



The above cut represents the best Box or Dump Scraper ever made for general use. It is made entirely of iron and steel. The bottom and back is one piece of steel, rolled expressly for this purpose; the sides are flange boiler plate, securely riveted and welded at the corners; handles are of gas pipe, light and strong. It will work in the toughest and most tenacious soil. It will carry its load without shaking off. The wear is distributed over the whole surface of the bottom. The bail can be removed in a moment, and yet will not become loose. Customers can always rely on getting Steel Bottoms, as we make no iron goods.

Price	$12 00

SCRAPER AND DITCHER.



HINTS ABOUT THE SCRAPER AND DITCHER.

The cut of the Scraper is regulated by the length of the chain, which holds the Scraper at any desired angle. If the chain is shortened too much, the Scraper stands too straight up and down. The angle at which it should stand depends somewhat upon the soil, but as a rule, let it back as far as it will cut well into the ground. We have had many cases where parties at first do not comprehend how to use it. They try to make hard work of it, lift it around like an old fashioned Scraper, and hitch the chain in the claw of the hammer-strap so short that the Scraper stands too straight up and down.

DIRECTIONS HOW TO USE THE SCRAPER AND DITCHER.

When shipped the Tongue and Scraper are separate.

FIRST—Put on the tongue, and with the draw-pin, which is also a wrench, screw up the nuts.

SECOND—Hook the chain into the claw of the hammer-strap at the end of the chain.

THIRD—Hitch on your team, and if the Scraper will not cut into the ground, shorten the chain a link at a time till it cuts enough.

FOURTH—Bear down on the handles and you throw the whole strength of the team upon the cutting edge.

FIFTH—When full, if you are going to haul it a long distance, or up grade, touch the lever with your foot, and the edge will rise from the ground.

SIXTH—In soft ground don't touch the handles, simply drive your team and the Scraper will load itself.

SEVENTH—In sod ground follow the sods endwise, if possible; if not, set the Scraper always so as to get under the edge of the sod.

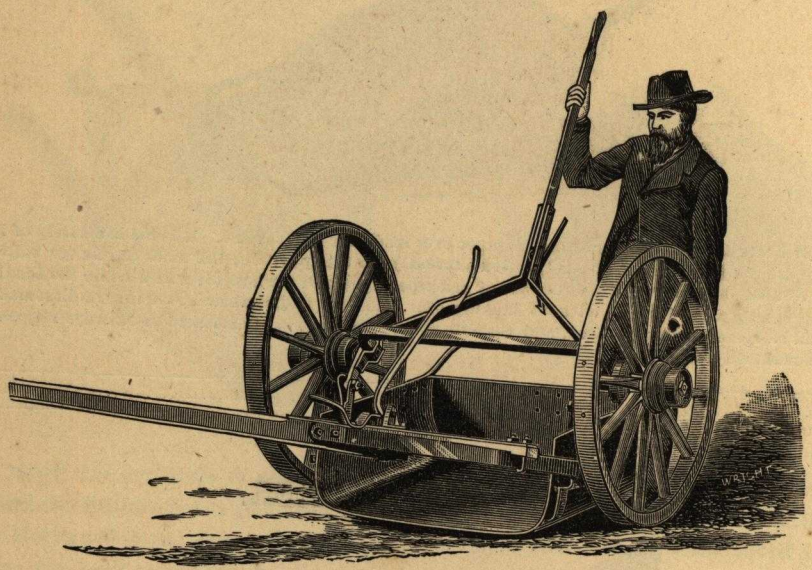
EIGHTH—Never have the second man to help—he is simply a bother—and do not lift it around, but drive your team and the Scraper will take care of itself.

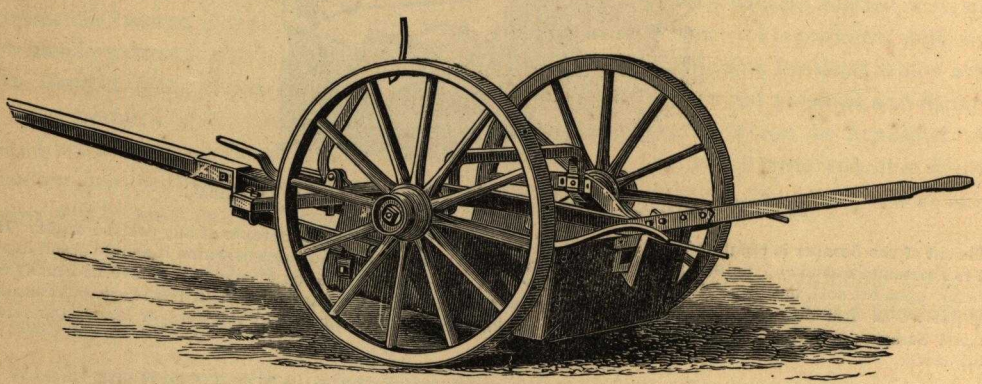
PRICES.

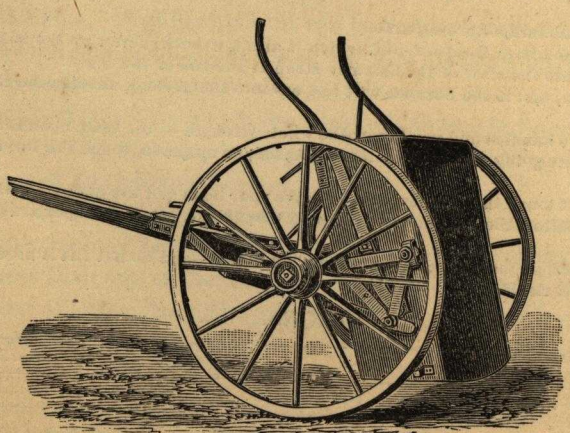
No. 1, Scraper and Ditcher, 48 inch	$14 00
No. 2, Scraper and Ditcher, 36 inch	14 00

All our Scrapers have Steel Bottoms, with Ground Edges. No Whiffletrees or Neck-Yokes furnished with Scrapers.

THE STUBBS-SCHULTZ PATENT WHEELED SCRAPER, OR SELF-LOADING AND SELF-DUMPING CART.







DESCRIPTION OF THE STUBBS-SCHULTZ PATENT WHEELED SCRAPER.

On hauls of from 50 to 600 feet, it will move earth so much cheaper than by any other known method, that it is placed beyond comparison with any other machinery or utensils in use. On hauls of from 600 to 1,400 feet, earth can be moved with the largest size Scrapers at one-half of what it will cost to do it with Wagons and Shovelers, besides enabling contractors to do work which it would be impossible to get done at times when labor is scarce.

It fills in any kind of soil, in which the Drag Scraper will fill, does not waste, and can be used on embankments of any height.

Being substantially built and simple in construction, it does not get out of order, with fair usage, and will wear many times as long as the common Drag Scraper, so that in the end, though the first cost is more, it is positively cheaper than those commonly used, aside from the superiority of its work.

There is no machine or implement so well adapted to the work required on public roads, or that will do the work as economically, as the one we offer. It will accomplish four times as much in a day, on average work in road districts, as those commonly used, and a road district once fully equipped with them need be at no further expense for grading tools for years.

The driver rides on the Lever of the Scraper when loaded, carrying a piece of board for a seat, and on the end of the Scraper Box when empty, placing his feet on the Cross-Bar, so that the same speed can be made as with Wagons.

We claim them superior to all other Grading Machines, for the following reasons:

1st. For their capacity.

2d. Their light draught.

3d. The ease with which they are handled, both in the pit and on the dump.

4th. Their simplicity. They are constructed with the least machinery possible to accomplish the result.

5th. Their durability. All the parts have been made stronger, as found necessary, until every part has been made substantial, so that repairs are unnecessary until the machine is worn out.

6th. They excel in Drag Scraper hauls, and save the cost of shoveling and time of teams while loading and unloading in wagon hauls.

7th. Because they dispense with shoveling, which would be a great advantage when labor is scarce, even if the cost were the same.

8th. Because a greater amount of earth can be moved with them in a given time, with less force and with much less expense, than with any other machine or utensil now known.

9th. Because of the quick motion the team will make on account of the light draught.

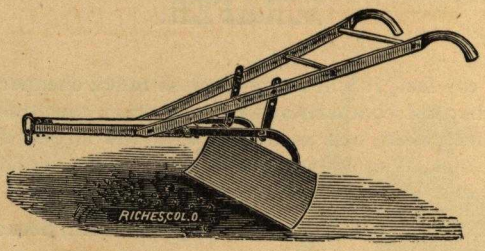
These implements have been severely tested in all kinds of soil and in all kinds of weather, and have never failed to give satisfaction.

No. 2. Capacity, 11 cubic feet; weight, 460 lbs. Price	$50 00
No. 3. Capacity, 15½ cubic feet; weight, 590 lbs. Price	55 00

No. 2, for hauls of from 50 to 500 feet; No. 3, for hauls of greater length. We do not furnish Whiffletrees or Neck-Yokes with Scrapers.

Parties ordering should bear in mind that there is the same economy in working these Scrapers in gangs of from ten to fifteen as in working the same number of Drag Scrapers in gangs, there being no more expense for foreman, dump boss and plow team, for this number, than for one-half the number.

SURFACE GRADER



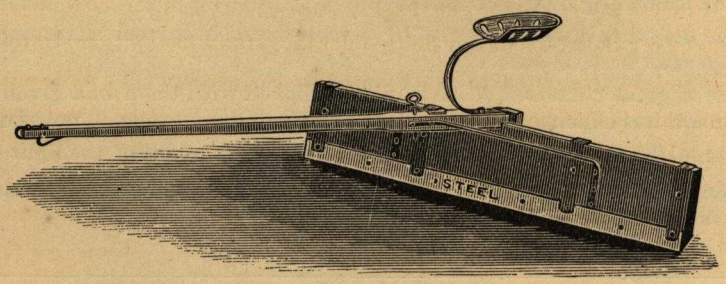
The above cut represents our Surface Grader. It is intended for one horse only, and designed to be used for removing the plowed ground from the sides of the roads to the road-bed immediately opposite. It is worked by either backing the horse up to the place of filling, or by crossing over from side to side; the driver retaining his load until the proper place is reached, or gradually losing it from beneath, as he may wish.

It is also of great service in grading and leveling off after the Scraper all uneven places, leaving the road-bed level, or rounded up, as desired. It is light, yet strong and durable.

The beam is made of wood and two substantial wrought-iron standards, as in the cut above. The blade is made of steel. The overseer will find this just the thing to keep his men at work. Anybody can use it, and any horse can draw it.

Price	$9 00

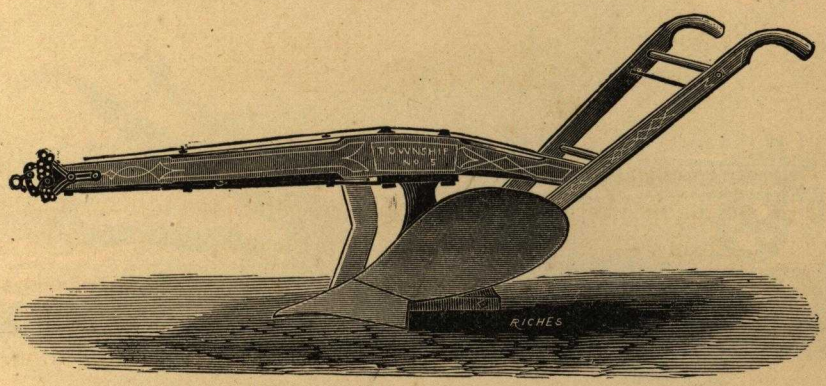
ROAD LEVELER.



This is designed for leveling and smoothing off rough, hard roads, whether frozen or dried. It is equally well adapted to smoothing dirt or gravel roads. It is strong and well made. The blade is made of steel, firmly bolted on. It is just the thing for cutting off the rough places and filling up the ruts on turnpike roads. It is well finished and painted.

Price	$12 00

NEW TOWNSHIP OR RAILROAD PLOW.



The above cut represents our New Township or Railroad Plow, which is made with special reference to township roadwork.

This Plow has great strength and durability, but is lighter than our well-known Grading Plows, Nos. 3 and 4 (see page 294), and weighs about 100 pounds. It is intended for 2 or 3 horses.

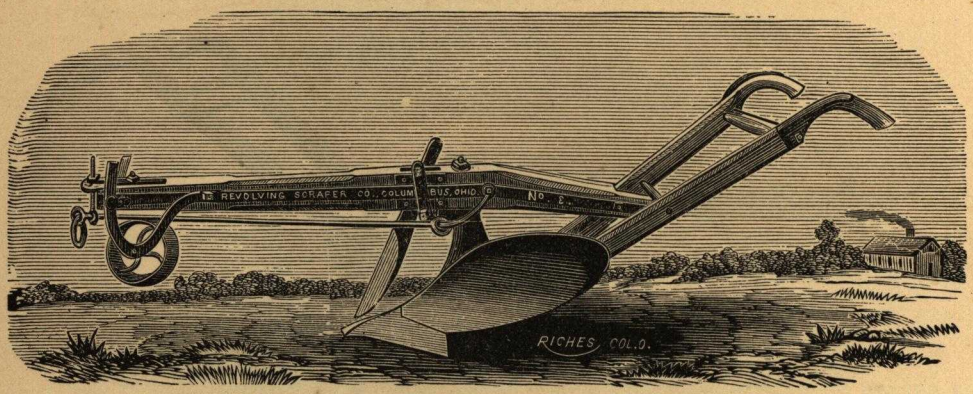
We use our Wrought Iron V-Shaped Standard, which is the best made, and cannot be broken.

The Mould-Board, Share and Land Side, are made from the very best steel. This Plow cuts a deep furrow, 11 inches wide, loosens up the soil and leaves it in the best possible condition for scraping. It can be regulated to cut any desired depth. Has a heavy iron strap the entire length of beam. The standard is secured to the beam with two strong bolts, and cannot be twisted or broken off. This Plow is made for Township use, and will do the work. We always furnish the Plow with plain share only, unless otherwise ordered.

No. 5, Left Hand, cuts 11 inches wide, 12 inches deep	$22 00
No. 15, Right Hand, cuts 11 inches wide, 12 inches deep	22 00
With extra Cutter Share	2 00

Try this Plow, and you will have one that will give you satisfaction.

TOWNSHIP ROAD AND RAILROAD PLOW.



RAILROAD, ROAD OR GRADING PLOW.

DESCRIPTION.

This plow is of great strength and remarkable lightness of draft. The standard is of wrought iron, V shaped; is secured to the beam by two strong bolts, and will not twist or break. The strongest standard known. The share, landside and mold board are of the very best steel. The plow is made to cut a deep rather than a wide furrow, and can be regulated to any depth required. It does not turn the soil over, but loosens it, leaving the trash on top, so that it will not interfere with the Scraper when filling. It has a gauge wheel, draught rod and all steel coulter, heavy iron beam, and extra long handles, which give the holder perfect control. We make two sizes of this plow, and can furnish either right or left hand.

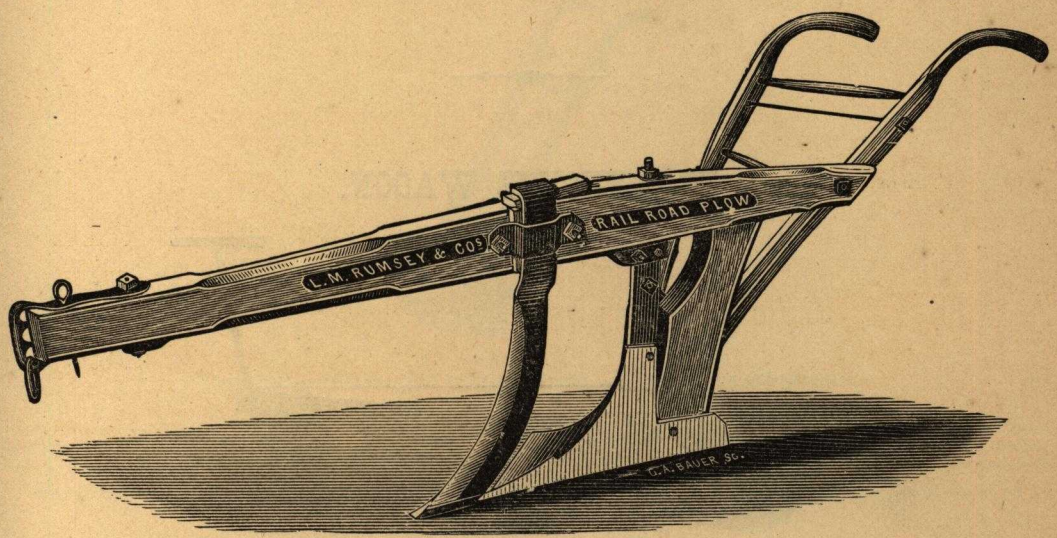
This plow will outlast several ordinary plows, and is, we believe, the best plow made for the money.

With the use of this plow and our well-known Automatic Revolving Road Scraper there is no apology for bad roads anywhere.

No. 3, Left Hand, weight 200 lbs	$30 00
No. 13, Right Hand, weight 200 lbs	30 00
No. 4, Left Hand, weight 150 lbs	26 00
No. 14, Right Hand, weight 150 lbs	26 00

Nos. 3 and 13 have braces from handles to beam.

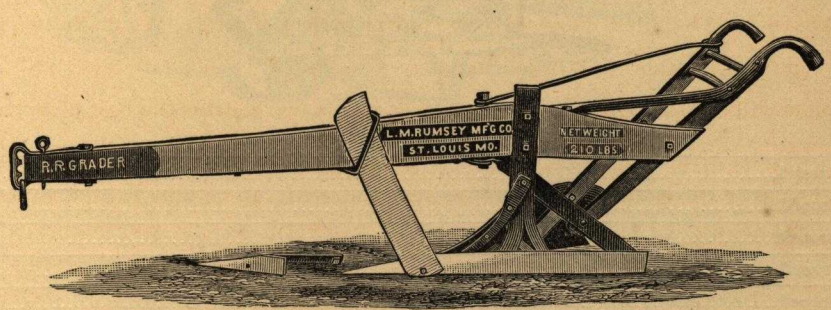
RAILROAD OR GRADING PLOW.



This Plow is constructed with special reference to strength, and is adapted to breaking new ground, and hard and grubby soils. It has sufficient strength to stand the draught of twenty yoke of cattle, and is an article that Railroad Companies cannot dispense with. We make them with and without the wooden upright.

Price.....	$38 00

RAILROAD OR GRADING PLOW.

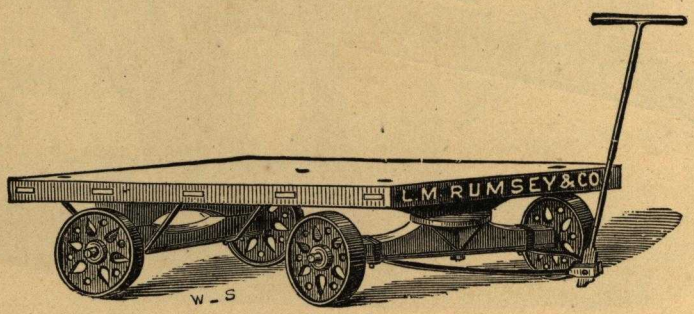


We make these Plows extra strong and heavy for railroad work, grading highways, and any heavy plowing where great strength is required. They have a strong wrought iron strap under the beam, and will stand any reasonable strain.

Price.....	$45 00

WAREHOUSE WAGONS AND TRUCKS.

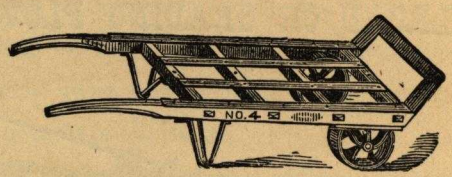
WAREHOUSE WAGON.



Warehouse Wagon, 2 feet 8 inches wide and 5 feet long, for handling grain, pork, merchandise, etc.

Warehouse Wagon, with four wheels	$30 00

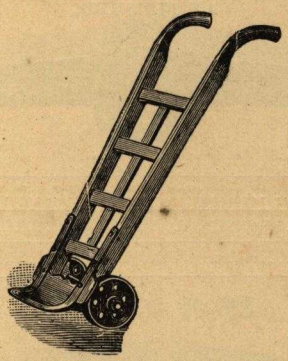
WAREHOUSE TRUCK.



No. 1, Half Ironed	$ 7 00
No. 1, Full Ironed	8 00
No. 2, Half Ironed	9 00
No. 2, Full Ironed	10 00
No. 3, Half Ironed	14 00
No. 3, Full Ironed	15 00
No. 4, Full Ironed, Railroad	20 00
No. 4, Full Ironed, Railroad, extra heavy	23 00
No. 5, Full Ironed, Levee, large wheels	27 00

We call the special attention of railroad men and merchants to the above, and can insure them a cheaper and better article than they can buy from any other manufacturers.

BAG TRUCKS.



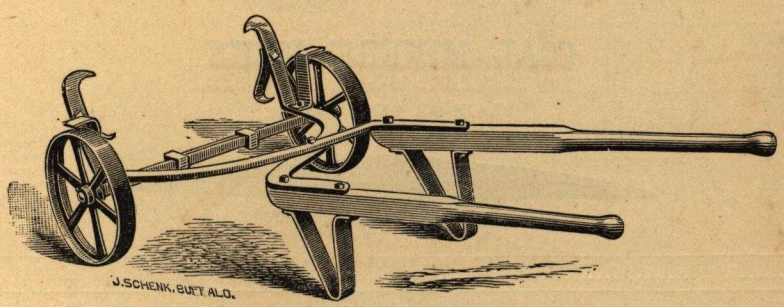
They are carefully made of the best material, and are strong and durable.

Bag Trucks, Bent Handles	$5 00

We can furnish, attached to the Bag Truck, a Cast Iron Barrel Holder, to prevent barrels from rolling off, at an additional cost—to the List price—of 25 cents each.

JOHNSON'S PATENT SELF-LOADING TRUCK.

No. 2.



DIRECTIONS.

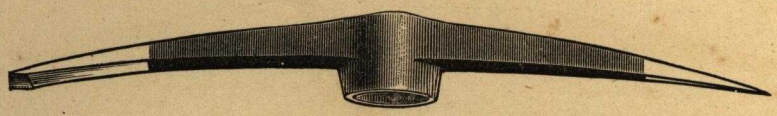
If the barrel or box is standing on end, grapple it so that the points are about four inches above the floor, pressing the sliding axle against the article. If the box or barrel is heavy, bring the handles together with force sufficient to prevent the points from slipping, and the operator should place his foot on the truck between the handles, bearing his weight back on the handles. To load a barrel when lying down, place the truck at the end, raise the handles nearly perpendicular, so that the sliding axle comes in contact with the head of the barrel, close the handles and the jaws will close together under the barrel. If the barrel is heavy, place the foot on the truck as before mentioned, and the weight of the operator will load it on the truck so that it will stand square on the end. Half barrels of iron, kegs of nails, boxes of tin, etc., can be loaded in like manner by small boys. When boxes are small, several can be loaded by taking hold of the bottom box with the truck.

No. 1 weighs 72 lbs., is suitable for packages up to 1600 lbs. weight, will clip packages from 12 to 26 inches wide.	$9 00
No. 2 weighs 52 lbs., is suitable for packages up to 500 lbs. weight, will clip packages from 10 to 22 inches wide.	6 50

This is a grand revolution in Trucks by which one man easily does the work of two or three men.

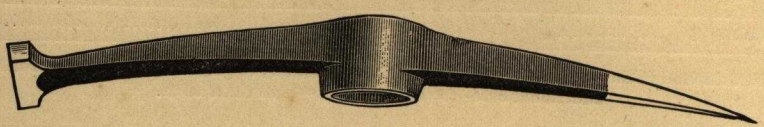
ADZE EYE RAILROAD OR CLAY PICKS.

AX FINISHED.



Weights, Assorted	4 to 5 lbs.	5 to 6 lbs.	6 to 7 lbs.	7 to 8 lbs.
Average Length, inches	23	24½	26	28
Price, per dozen	$11 00	12 00	13 00	14 00

RAILROAD TAMPING PICKS.



Weights, Assorted	6 to 7 lbs.	7 to 8 lbs.
Average Length, inches	24	26
Price, per dozen	$17 00	18 00

COAL MINERS' PICKS.

PLAIN OR AX FINISHED.

Number	1	2	3	4
Weight, pounds	2	2½	3	3½
Length, inches	16	17½	19	20½
Price, per dozen	$8 50	9 00	9 50	10 00

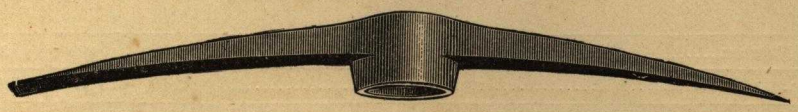
COMMON EYE COAL MINERS' PICKS.

NUMBERS AND PRICES THE SAME AS THE ADZE EYE.

☞Packed two dozen of each kind in one Box.

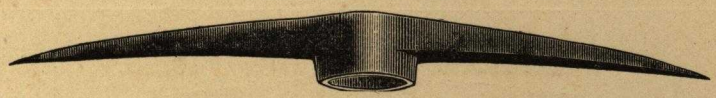
ADZE EYE CALIFORNIA OR MINERS' PICKS.

SURFACE PICKS.



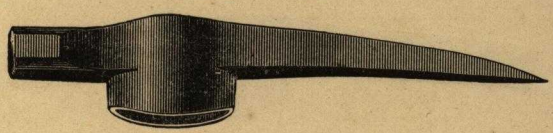
Number	1	2	3	4	5	6	7
Weight, pounds	4	4½	5	5½	6	6½	7
Length, inches	25	26	27	27½	28	28½	29
Price, per dozen	$14 00	15 00	16 00	17 00	18 00	19 00	20 00

DRIFTING PICKS.



Number	1	2	3	4	5
Weight, pounds	3	4	4½	5	6
Length, inches	19	21	23	25	26
Price, per dozen	$12 50	14 00	15 00	16 00	17 50

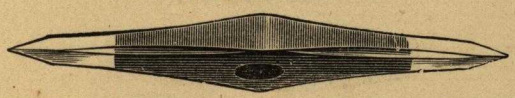
POLL PICKS.



Number	1	2	3	4	5	6
Weight, pounds	3½	4	4½	5¼	6	6¾
Length, inches	13½	14	15	17	18	21¼
Price, per dozen	$15 00	16 00	17 00	18 50	20 00	21 50

STONE PICKS.

AX FINISHED.



Weights, assorted	6 to 7 lbs.	7 to 8 lbs.	8 to 9 lbs.
Price, per dozen	$16 50	17 50	18 50

MILL PICKS,

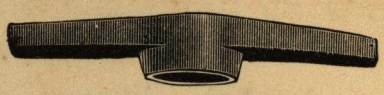
AX FINISHED OR PLAIN.

Solid Cast Steel, assorted	2 to 2½ lbs.	2½ to 3 lbs.
Price, per dozen	$20 00	22 00

☞Packed two dozen of each kind in one box.

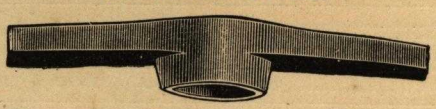
EYES READY FOR THE STEEL.

COAL PICKS.



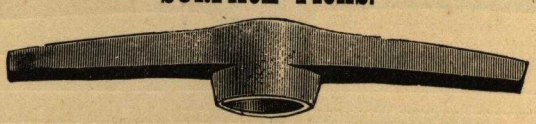
For Coal Picks, Number	1	2	3	4
Price, per dozen	$6 50	7 00	7 50	8 00

DRIFTING PICKS.



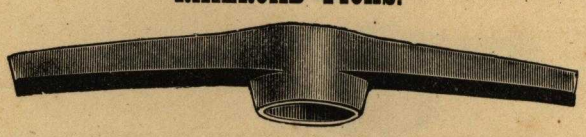
For Drifting Picks, Number	1	2	3	4	5
Price, per dozen	$7 50	8 50	9 00	9 50	10 50

SURFACE PICKS.



For Surface Picks, Number	1	2	3	4	5	6	7
Price, per dozen	$8 50	9 00	9 50	10 00	10 50	11 00	11 50

RAILROAD PICKS.

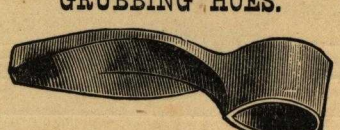


For Railroad Picks, pounds	4½	5	6	7	8
Price, per dozen	$9 00	9 50	10 50	11 50	12 50

TAMPING PICKS.

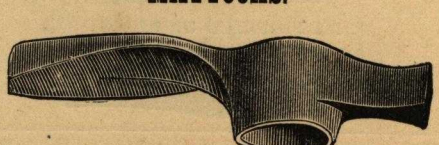
For Tamping Picks, pounds	6	7	8
Price, per dozen	$11 00	12 00	13 00

GRUBBING HOES.



For Grubbing Hoes, Number	0	1	2	3
Price, per dozen	$7 50	8 00	8 50	9 00

MATTOCKS.

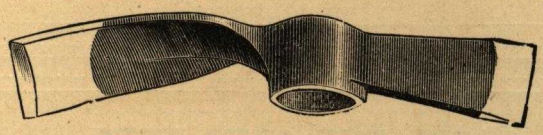


For Mattocks, pounds	5½	6	7
Price, per dozen	$10 00	10 50	11 50

ADZE EYE MATTOCKS,

AX FINISHED.

WESTERN PATTERN.

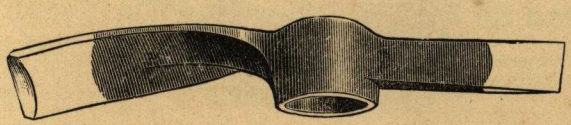


AVERAGES.	Short Cutter.	Long Cutter.
Average weight of Mattock, pounds	5½	6
Average length and width of Hoe, inches	8¼ x 4¼	8⅛ x 4¼
Average length and width of Cutter, inches	4½ x 3½	6 x 3½
Price, per dozen	$18 50	19 00

THE X. L. N. T., WESTERN PATTERN.

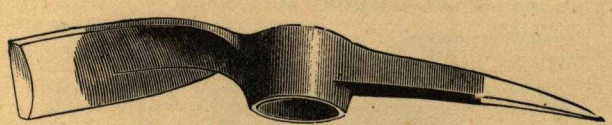
AVERAGES.	Short Cutter.	Long Cutter.
Average weight of Mattock, pounds	5	5
Average length and width of Hoe, inches	8 x 4	8¼ x 4
Average length and width of Cutter, inches	4½ x 3½	5¾ x 3½
Price, per doz	$17 50	17 50

PITTSBURG OR NARROW PATTERN.



AVERAGES.	Short Cutter.	Long Cutter.
Average weight of Mattock, pounds	5½	6
Average length and width of Hoe, inches	8½ x 3	8⅛ x 3
Average length and width of Cutter, inches	4½ x 2½	6 x 2½
Price, per dozen	$18 50	19 00

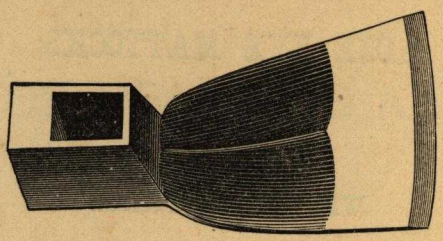
PICK MATTOCKS.



AVERAGES.	X. L. N. T.	Regular.
Average weight of Mattock, pounds	5	6
Average length and width of Hoe, inches	8 x 4	8½ x 4½
Average length of Pick end, inches	8½	9
Price, per dozen	$17 50	19 00

Packed two dozen of each kind in one box.

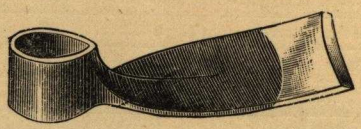
CAST STEEL RAILROAD ADZE.



Width of Cut, inches	4 to 6½
Price, per dozen	$26 00

ADZE EYE GRUB HOES,

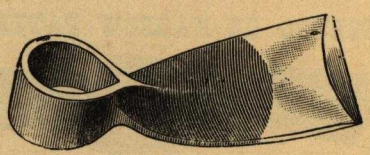
AX FINISHED, OVAL EYE.



Number	0	1	2	3
Average weight, pounds	3	3¼	4	4½
Average width of Hoe, inches	3½	3¾	4	4¼
Average whole length of Hoe, inches	10¼	10¾	11¼	11½
Price, per dozen	$12 50	13 00	13 50	14 00

BALTIMORE PATTERN GRUB HOES,

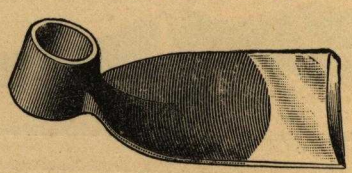
AX FINISHED, COMMON OVAL EYE.



Number	1	2	3	4
Average weight, pounds	3½	4¼	5	5¾
Average width of Hoe, inches	3¾	4½	5	5¾
Average whole length of Hoe, inches	10¾	11	11½	12
Price, per dozen	$13 00	14 00	15 00	16 00

ADZE EYE SPROUTING HOES,

AX FINISHED, ROUND EYE.



Average weight, pounds	3
Average width of Hoe, inches	4½
Average whole length of Hoe, inches	10¾
Price, per dozen	$16 50

Packed two dozen of each kind in one box.

HANDLES.

TURNED, POLISHED HICKORY AX HANDLES.

PER DOZEN.

No. Extra Ax Handles, all white, 36-inch	$2 45	No. 1 Ax Handles, 38-inch	$2 00
No. 1 Ax Handles, 36-inch	1 90	No. 2 Ax Handles, 38-inch	1 55
No. 2 Ax Handles, 36-inch	1 45	No. Extra Ax Handles, 40-inch	2 75
No. N Ax Handles, 36-inch	1 25	No. 1 Ax Handles, 40-inch	2 25
No. 3 Ax Handles, 36-inch	1 00	No. 2 Ax Handles, 40-inch	1 75
No. Extra Ax Handles, 38-inch	2 55		

HAND SHAVED POLISHED HICKORY AX HANDLES,

SCROLL OR FANCY ENDS.

No. XXX Octagon or Oval, all white, 36-inch	$3 00
No. XX Octagon or Oval, 36-inch	2 50
No. X Octagon or Oval, 36-inch	2 20

HAND SHAVED POLISHED HICKORY AX HANDLES,

PLAIN ENDS.

No. XXX Octagon or Oval, all white, 36-inch	$2 80
No. XX Octagon or Oval, 36-inch	2 35
No. X Octagon or Oval, 36-inch	2 10

HAND SHAVED STRAIGHT LUMBERMEN'S AX HANDLES.

No. XXX Straight Lumberm's Ax Handles, 36-in.	$2 85	No. XXX Straight Lumberm's Ax Handles, 38-in.	$3 00
No. XX Straight Lumberm's Ax Handles, 36-in.	2 50	No. XX Straight Lumberm's Ax Handles, 38-in.	2 75

DOUBLE BITTED AX HANDLES.

No. Extra DB Ax Handles, all white, 34 and 36-in.	$2 45
No. 1 Extra DB Ax Handles, 34 and 36-inch	1 90
No. 2 Extra DB Ax Handles, 34 and 36-inch	1 45

BOY'S AX HANDLES.

No. Extra Boy's Ax Handles, 26 and 28-inch	$1 75
No. 1 Boy's Ax Handles, 26 and 28-inch	1 40
No. 2 Boy's Ax Handles, 26 and 28-inch	1 10

HOUSE CARPENTERS', SHIP AND RAILROAD ADZE HANDLES.

No. Extra, 32-inch	$2 75	Broad Ax Handles	$2 60
No. 1, 32-inch	2 10	Shingle Hatchet Handles	0 45
No. 2, 32-inch	1 45	A. & R. E. Hammer Handles	0 45

BROAD OR BENCH HATCHET HANDLES.

15-inch	$0 45	18-inch	$0 70
16-inch	0 60	19-inch	0 90
17-inch	0 70	20-inch	0 90

CANT-HOOK HANDLES, Etc.

Cant-Hook Handles, 4½ feet length, "Plain"	$3 15	Mill Pick Straight Handles	$1 25
Ice-Hook Handles	1 75	Mill Pick Square Head	2 85

HANDLES—Continued.

SURFACE, OR RAILROAD PICK HANDLES.

	Per doz.		Per doz.
No. Extra, all white, 36-inch	$2 55	No. 2, 36-inch	$1 45
No. Excelsior, nearly all white, 36-inch	2 00	No. A, 36-inch	1 15
No. 1, 36-inch	1 65		

POLL PICK HANDLES.

No. Extra, 32, 34 and 36-inch	$2 90
No. 1, 32, 34 and 36-inch	2 10
No. 2, 32, 34 and 36-inch	1 40

DRIFTING PICK HANDLES.

No. Extra, 32, 34 and 36-inch	$2 90
No. 1, 32, 34 and 36-inch	2 10
No. 2, 32, 34 and 36-inch	1 40

GRUB HOE HANDLES.

No. Extra	$2 55	No. 1	$1 65

MATTOCK HANDLES.

No. 1, Eye 2 x 3, 36 inches long	$1 65	No. 2, Eye 2 x 3, 36 inches long	$1 45

BRUSH HOOKS AND PRUNING KNIFE HANDLES.

No. 1, 36 inches long	$1 75

COAL MINERS' PICK HANDLES.

Small Pattern, No. 1 size, Eye 3 x ⅝, 34-inch, Extra, per dozen	$1 65
Medium Pattern, No. 2 size, Eye 3 x ¾, 34-inch, No. 1, per dozen	1 40
Large Pattern, No. 3 size, Eye 3⅛ x ⅞, 34-inch, No. 2, per dozen	1 15

SLEDGE, TOOL, MAUL OR CHISEL HANDLES.

No. Extra, 24 and 26-inch	$1 05	No. Extra, 34 and 36-inch	$1 65
No. 1, 24 and 26-inch	0 85	No. 1, 34 and 36-inch	1 40
No. Extra, 28 and 30-inch	1 35	No. Extra, 38-inch	1 75
No. 1, 28 and 30-inch	1 20	No. 1, 38-inch	1 50
No. Extra, 32-inch	1 45	No. Extra, 40-inch	2 00
No. 1, 32-inch	1 25	No. 1, 40-inch	1 75

Hand Shaved Sledge add 20 cents dozen to above prices.

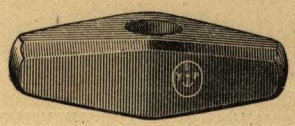
MACHINISTS', BOILER MAKERS' AND BLACKSMITHS' HAMMER HANDLES.

15-inch	$0 55	20-inch	$0 85
16-inch	0 60	22-inch	0 90
18-inch	0 75	24-inch	1 00

AUGER HANDLES, Etc.

Auger Handles, per gross	$4 40	Coopers' Drivers	$2 20
Cross Cut Saw Handles	4 60	Coopers' Ax	1 20

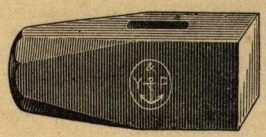
SOLID CAST STEEL NAPPING HAMMER.



Per pound	$ 0 36

Of any desired weight.

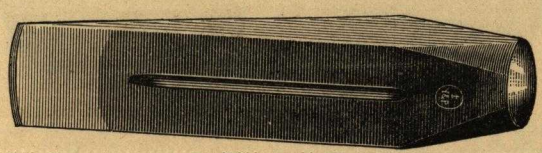
SOLID CAST STEEL SET HAMMER.



Per pound	$ 0 55

SOLID CAST STEEL WEDGE.

TRUCKEE PATTERN.



Per pound	$ 0 30

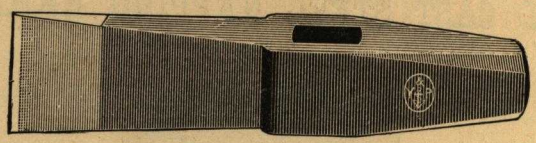
Weights, assorted from 2¼ to 10 lbs.

SOLID CAST STEEL COAL WEDGE.

Per pound	$ 0 30

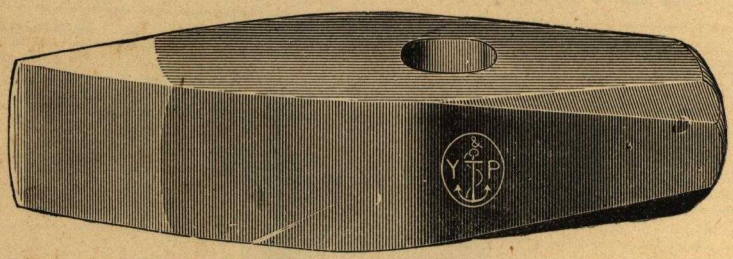
Of any desired weight.

SOLID CAST STEEL HOT CHISEL.



Per pound	$ 0 50

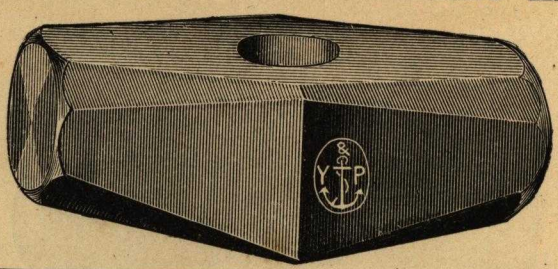
SOLID CAST STEEL RAILROAD COLD CHISEL.



Per pound	$ 0 50

Of the best English Cast Steel, made specially for this purpose.

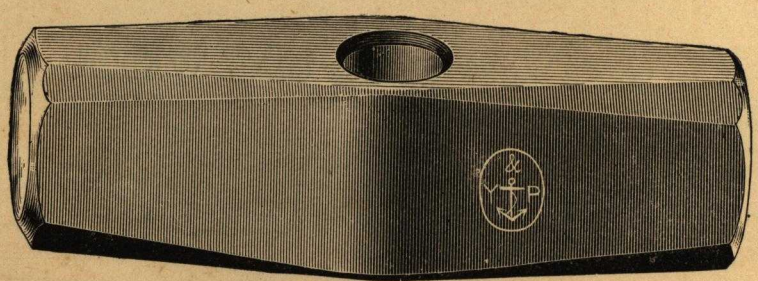
SOLID CAST STEEL HAND DRILLING HAMMER.



Per pound	$ 0 36

From 3 to 5 pounds.

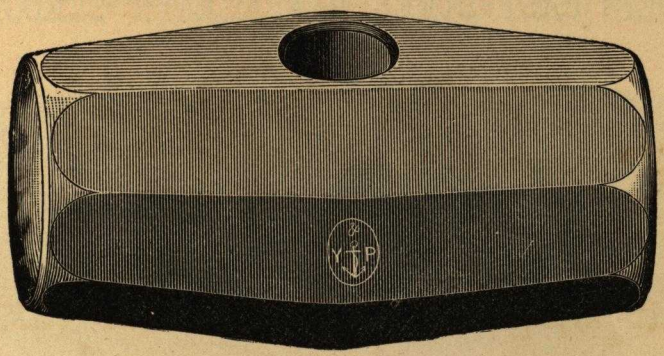
SOLID CAST STEEL COAL SLEDGE.



Per pound	$ 0 30

Of any desired weight.

SOLID CAST STEEL HORSE SHOE TURNING SLEDGE.

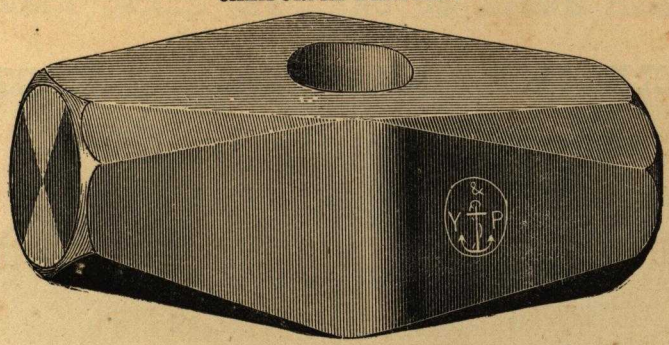


Per pound	$ 0 32

Of any desired weight.

SOLID CAST STEEL DRILLING HAMMER.

CALIFORNIA PATTERN.

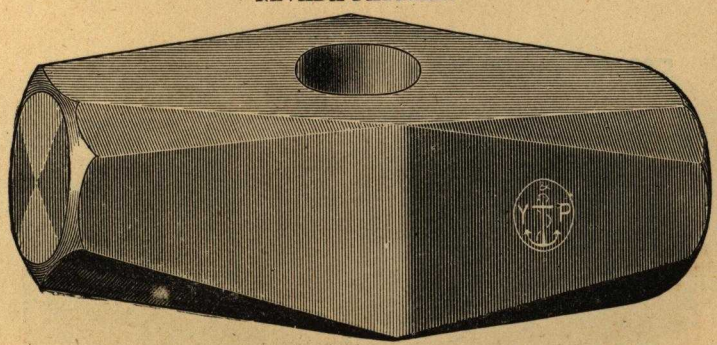


Under 5 lbs., Black, Polished Face, per lb	$ 0 36
5 lbs. and over, Black, Polished Face, per lb	0 30
5 lbs. and over, Full Polished, per lb	0 35
5 lbs. and over, Full Polished and Handled, per lb	0 40

Of any desired weight.

SOLID CAST STEEL DRILLING HAMMER.

NEVADA PATTERN.

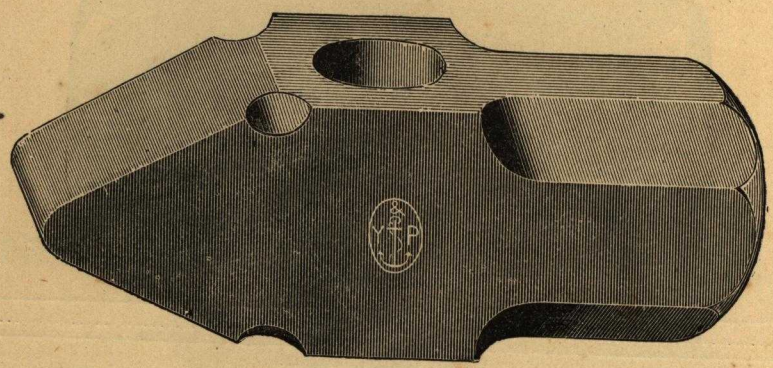


Under 5 lbs., Black, Polished Face, per lb	$ 0 36
5 lbs. and over, Black, Polished Face, per lb	0 30
5 lbs. and over, Full Polished, per lb	0 35
5 lbs. and over, Full Polished and Handled, per lb	0 40

Of any desired weight.

SOLID CAST STEEL BLACKSMITH SLEDGE.

CROSS PEIN.

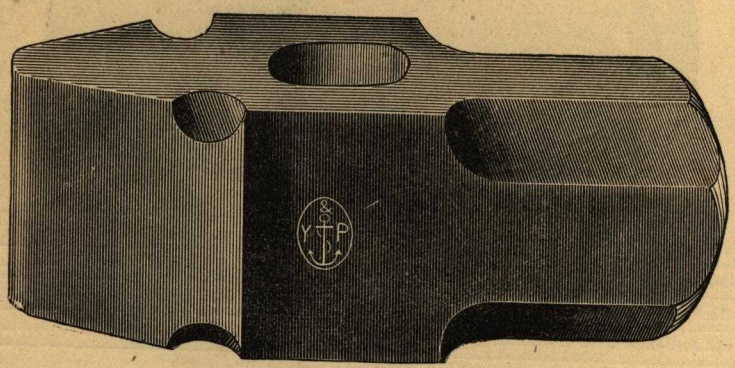


Per pound	$0 30

Of any desired weight.

SOLID CAST STEEL BLACKSMITH SLEDGE.

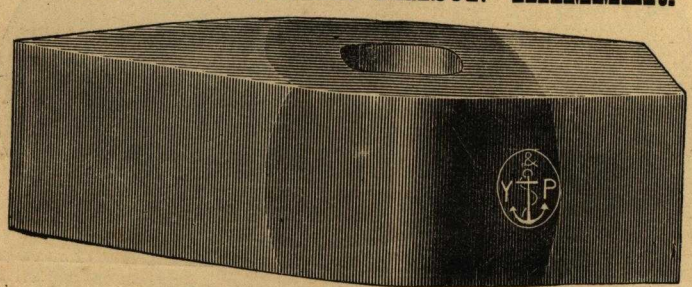
STRAIGHT PEIN.



Per pound	$0 30

Of any desired weight.

SOLID CAST STEEL MASON HAMMER.

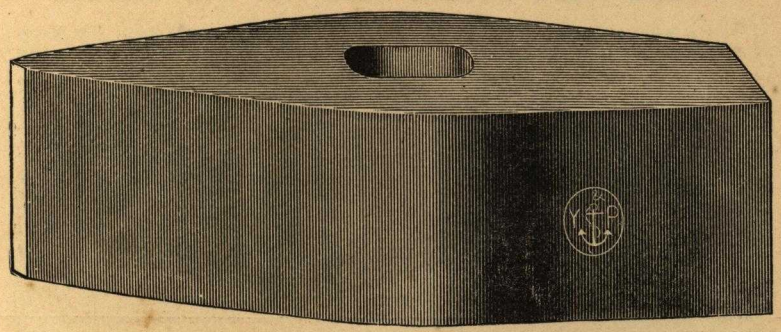


Per pound	$0 40

Of any desired weight.

SOLID CAST STEEL SPALLING OR STONE HAMMER.

SINGLE FACE.

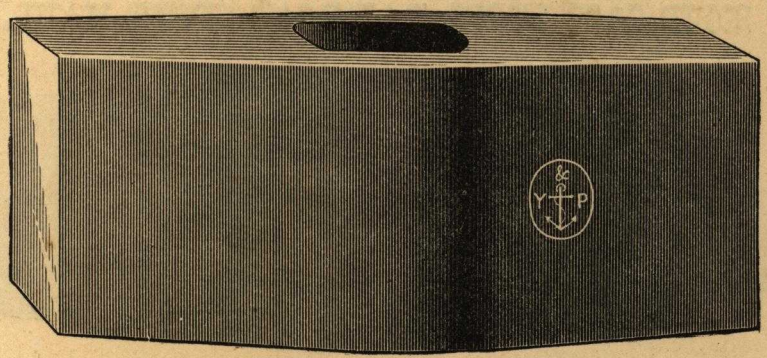


Per pound	$0 30

Of any desired weight.

SOLID CAST STEEL SPALLING OR STONE HAMMER.

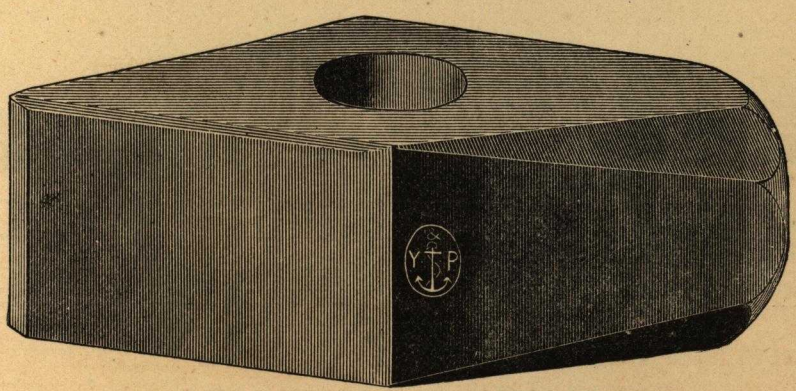
DOUBLE FACE.



Per pound	$0 30

Of any desired weight.

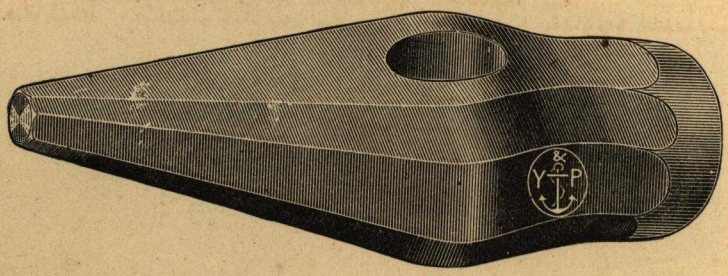
SOLID CAST STEEL STONE SLEDGE.



Per pound	$0 30

Of any desired weight.

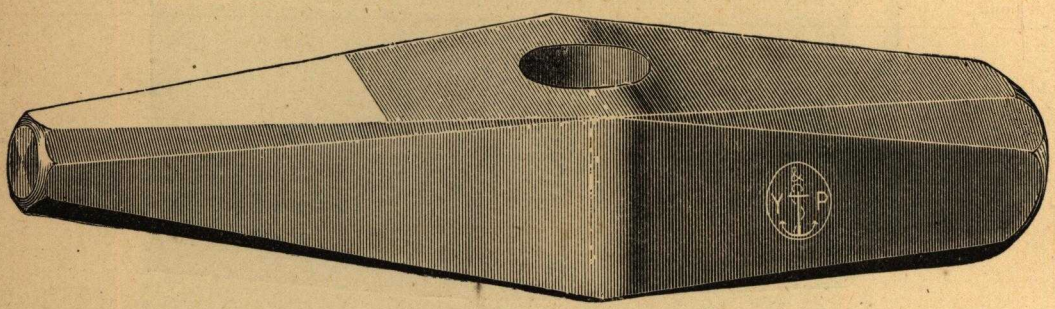
SOLID CAST STEEL SHIP OR TOP MAUL.



Black, Polished Face, per pound	$0 40
Full Polished, per pound	0 45
Full Polished and Handled, per pound	0 50

Of any desired weight.

SOLID CAST STEEL RAILROAD SPIKE MAUL.



Black, Polished Face, per pound	$0 40
Full Polished, per pound	0 45
Full Polished and Handled, per pound	0 50

Of any desired weight.

CROW BARS.

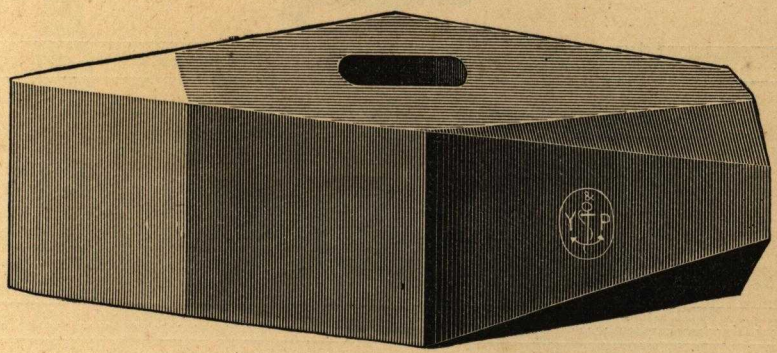
Best Cast Steel Points, weight from 10 to 60 pounds each	$0 07
Solid Cast Steel Bars, weight from 6 to 9 pounds each	0 11
Solid Cast Steel Bars, weight from 10 to 25 pounds each	0 13

CLAW AND PINCH BARS.

Best Cast Steel Points, per pound	$0 12

Made to order, any weight desired.

SOLID CAST STEEL WOOD CHOPPERS' MAUL.

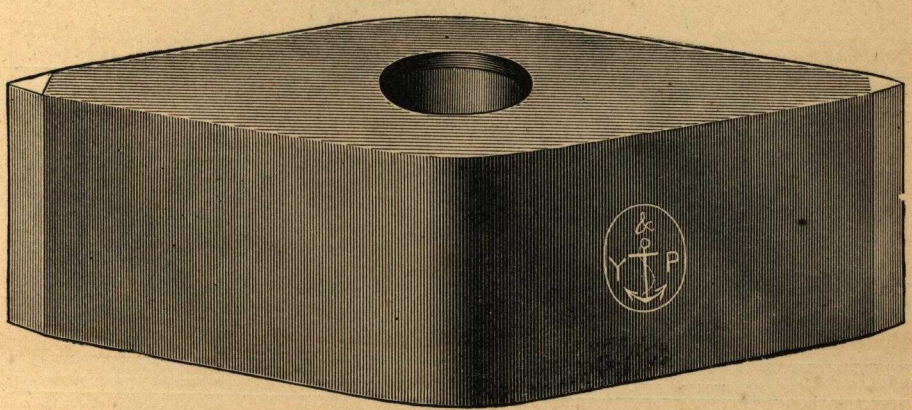


SOLID CAST STEEL WOOD CHOPPERS' MAUL.

Per pound	$0 30

Of any desired weight

SOLID CAST STEEL STONE AX.

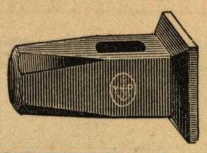


SOLID CAST STEEL STONE AX.

Per pound	$0 30

Of any desired weight.

SOLID CAST STEEL FLATTER.

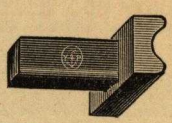


Per pound	$0 50

SOLID CAST STEEL TOP SWEDGE.

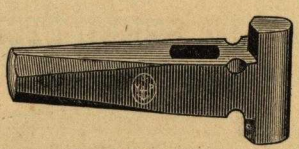
Per pound	$0 55

SOLID CAST STEEL BOTTOM SWEDGE.



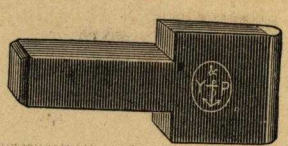
Per pound	$0 55

SOLID CAST STEEL TOP FULLER.



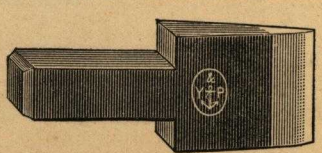
Per pound	$0 55

SOLID CAST STEEL BOTTOM FULLER.



Per pound	$0 55

SOLID CAST STEEL HARDIE.

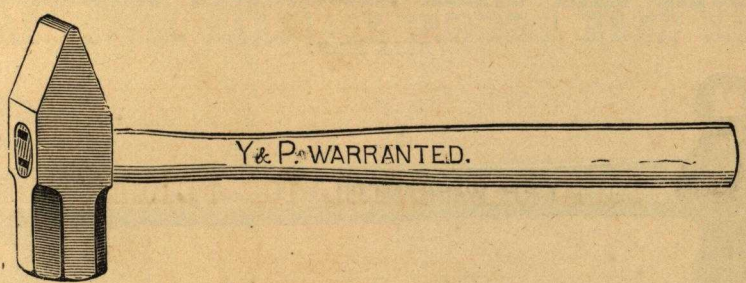


Per pound	$0 55

SOLID CAST STEEL RIVETING HAMMER.

Number	0	1	2	3	4	5	6	7
Weight	7 oz.	9 oz.	12 oz.	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.	1 lb 12 oz.	2 lbs.
Per dozen	$4 00	4 75	5 50	6 00	6 50	7 00	8 00	9 00

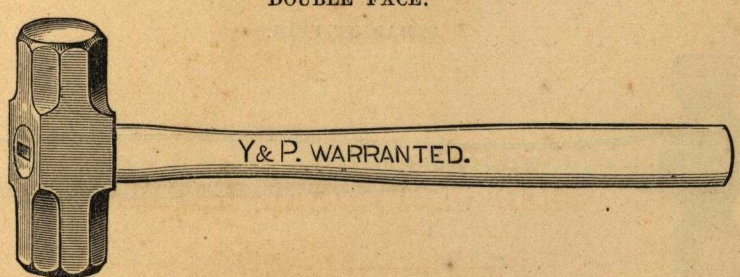
SOLID CAST STEEL ENGINEERS' HAMMER.



Number	0	1	2	3	4	5
Weight	1 lb. 10 oz.	2 lb.	2 lb. 8 oz.	3 lb. 4 oz.	3 lb. 14 oz.	5 lb.
Per dozen	$8 50	10 00	12 50	15 00	17 50	19 00

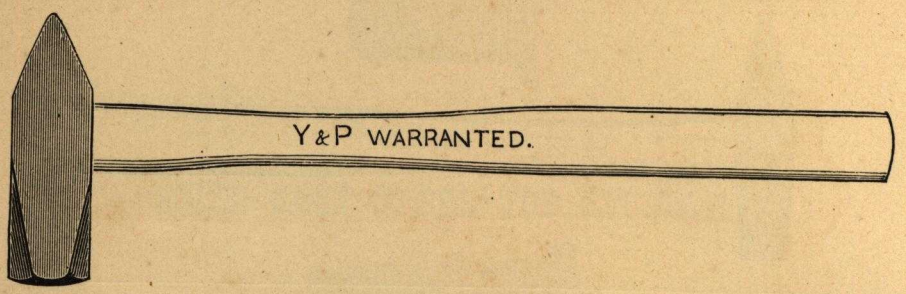
SOLID CAST STEEL ENGINEERS' HAMMER.

DOUBLE FACE.



Number	0	1	2	3	4
Weight	1 lb. 9 oz.	2 lb.	2 lb. 12 oz.	3 lb. 8 oz.	4 lb. 3 oz.
Per dozen	$8 00	12 00	14 25	16 75	19 25

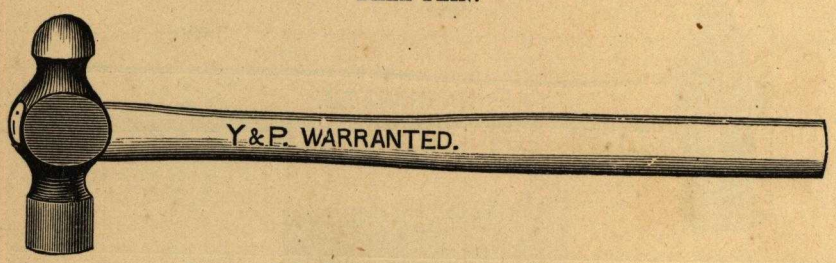
SOLID CAST STEEL BLACKSMITHS' HAND HAMMER.



Number	0	1	2	3
Weight	2 lb.	2 lb. 8 oz.	3 lb. 8 oz	4 lb.
Per dozen	$10 00	12 50	15 00	17 50

SOLID CAST STEEL MACHINISTS' HAMMER,

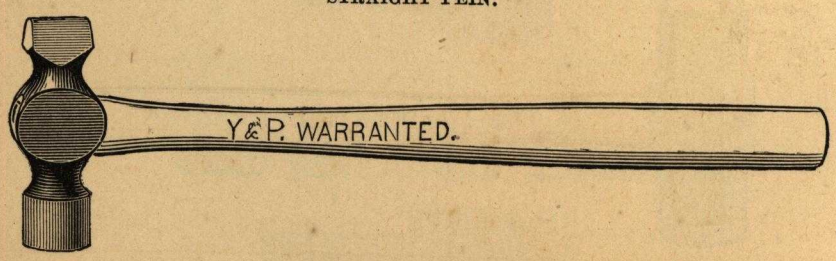
BALL PEIN.



Number	0000	000	00	0	1	2	3	4	5	6	7	8
Weight	8 oz.	12 oz.	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.	1 lb. 14 oz.	2 lb. 3 oz.	2 lb. 8 oz.	2 lb. 12 oz.	3 lb.	3 lb. 5 oz.	3 lb. 12 oz.
Per dozen	$11 00	11 00	11 00	13 00	14 00	16 00	18 00	20 00	22 00	24 00	26 00	28 00

SOLID CAST STEEL MACHINISTS' HAMMER,

STRAIGHT PEIN.



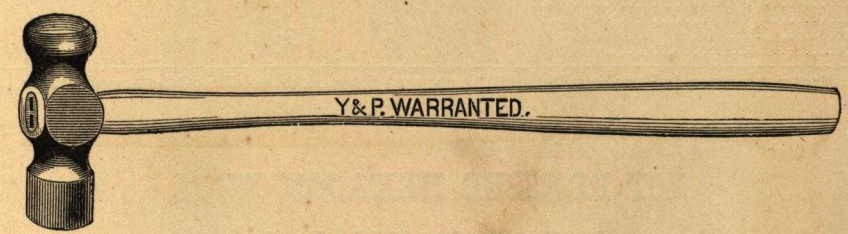
Number	0000	000	00	0	1	2	3	4	5	6
Weight	8 oz.	12 oz.	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.	1 lb. 14 oz.	2 lb. 3 oz.	2 lb. 8 oz.	2 lb. 12 oz.	3 lb.
Per dozen	$11 00	11 00	11 00	13 00	14 00	16 00	18 00	20 00	22 00	24 00

SOLID CAST STEEL MACHINISTS' HAMMER.

CROSS PEIN.

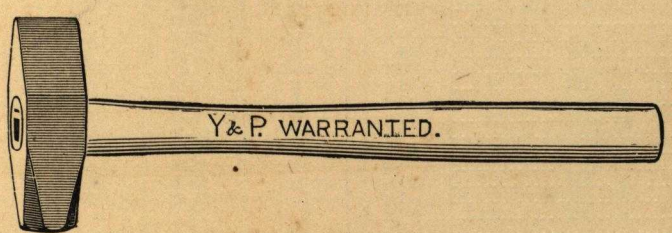
Number	0000	000	00	0	1	2	3	4	5	6
Weight	8 oz.	12 oz.	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.	1 lb. 14 oz.	2 lb. 3 oz.	2 lb. 8 oz.	2 lb. 12 oz.	3 lb.
Per dozen	$11 00	11 00	11 00	13 00	14 00	16 00	18 00	20 00	22 00	24 00

SOLID CAST STEEL CARRIAGE IRONERS' HAND HAMMER.



Number	2	3
Weight	2 lb 12 oz.	3 lb. 10 oz.
Per dozen	$15 00	17 50

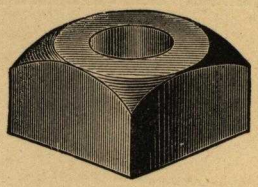
SOLID CAST STEEL CHIPPING HAMMER.



Number	0	1	2	3	4
Weight	1 lb. 5 oz.	2 lb.	2 lb. 9 oz.	3 lb. 1 oz.	3 lb. 6 oz.
Per dozen	$7 25	8 50	10 00	12 50	15 00

HOT PRESSED SQUARE NUTS.

PACKED IN KEGS, 200 LBS. EACH.

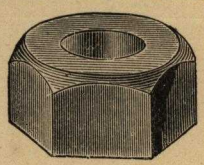


NUMBER.	Width.	Thickness.	Hole.	Size of Bolt.	No. of Nuts in Keg of 200 lbs.	Price per Pound.
Number 0	13-32	3-16	5-32	3-16		$0 30
Number 1	½	¼	7-32	¼	13,332	0 20
Number 2	⅝	5-16	9-32	5-16	6,808	0 17
Number 3	¾	⅜	11-32	⅜	3,636	0 15
Number 4	⅞	7-16	13-32	7-16	2,538	0 13½
Number 5	⅞	½	7-16	½	2,260	0 13½
Number 6	1	½	7-16	½	1,624	0 12½
Number 7	1⅛	⅝	½	9-16	1,354	0 12½
Number 8	1⅛	⅝	9-16	⅝	1,180	0 12½
Number 9	1¼	⅝	9-16	⅝	8'0	0 12
Number 10	1⅜	¾	21-32	¾	600	0 12
Number 11	1⅜	¾	21-32	¾	490	0 11½
Number 12	1⅝	⅞	25-32	⅞	346	0 11½
Number 13	1¾	⅞	25-32	⅞	324	0 11½
Number 14	1¾	1	⅞	1	294	0 11½
Number 15	2	1	⅞	1	216	0 11½
Number 16	2	1⅛	15-16	1⅛	190	0 11½
Number 17	2¼	1⅛	15-16	1⅛	146	0 11½
Number 18	2¼	1¼	1 1-16	1¼	134	0 12½
Number 19	2½	1¼	1 1-16	1¼	114	0 12½
Number 20	2¾	1⅜	1 3-16	1⅜	74	0 12½
Number 21	3	1½	1 5-16	1½	68	0 13
Number 22	3¼	1⅝	1 7-16	1⅝	52	0 13
Number 23	3½	1¾	1 9-16	1¾	44	0 14
Number 24	3¾	1⅞	1 11-16	1⅞	38	0 14
Number 25	4	2	1 13-16	2	28	0 14

Sizes not enumerated on above lists will be charged extra, at discretion of the Manufacturer.

HOT PRESSED HEXAGON NUTS.

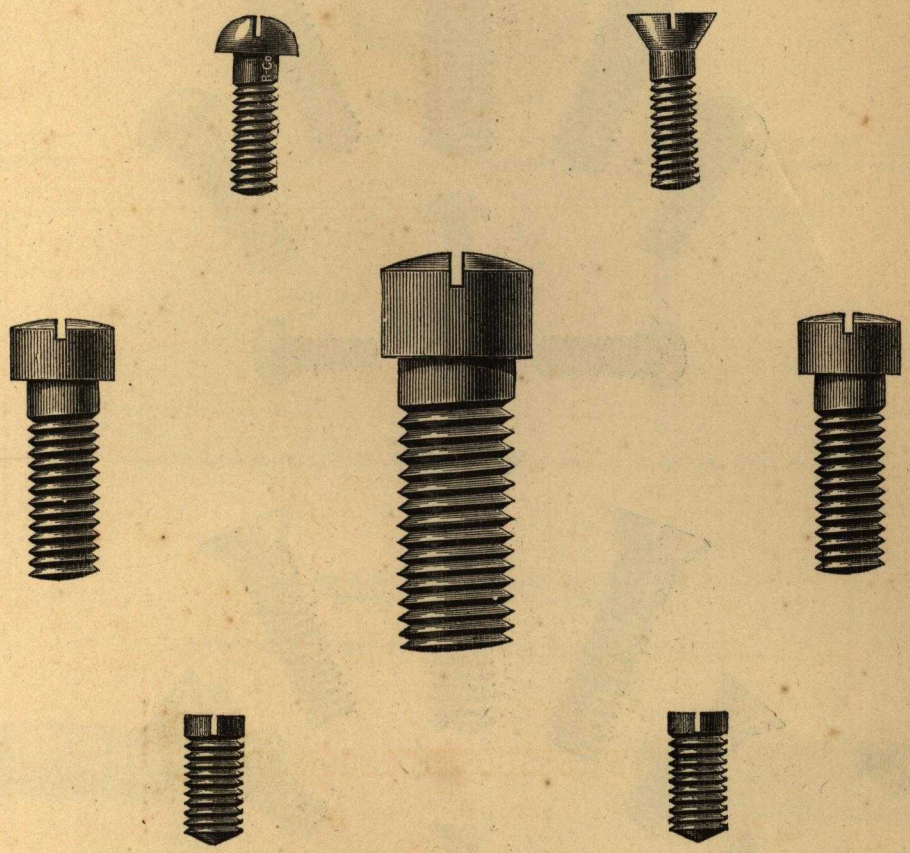
PACKED IN KEGS, 200 LBS. EACH.



NUMBER.	Width.	Thickness.	Hole.	Size of Bolt.	No. of Nuts in Keg of 200 lbs.	Price per Pound.
Number 26	½	¼	7-32	¼	14,000	$0 30
Number 27	⅝	5-16	9-32	5-16	8,888	0 25
Number 28	¾	⅜	11-32	⅜	6,038	0 20
Number 29	⅞	7-16	13-32	7-16	2,700	0 18
Number 30	⅞	½	7-16	½	2,520	0 18
Number 31	1	½	7-16	½	2,050	0 16
Number 32	1⅛	9-16	½	9-16	1,650	0 16
Number 33	1⅛	⅝	9-16	⅝	1,276	0 16
Number 34	1¼	⅝	9-16	⅝	988	0 15
Number 35	1¼	¾	9-16	⅝	908	0 15
Number 36	1⅜	¾	21-32	¾	740	0 15
Number 37	1⅜	¾	21-32	¾	600	0 14½
Number 38	1½	⅞	21-32	¾	574	0 14½
Number 39	1⅝	⅞	25-32	⅞	450	0 14½
Number 40	1⅝	1	25-32	⅞	400	0 14½
Number 41	1¾	1	⅞	1	326	0 14½
Number 42	1¾	1⅛	⅞	1	286	0 14½
Number 43	2	1¼	15-16	1⅛	210	0 14½
Number 44	2¼	1⅜	1 1-16	1¼	160	0 15½
Number 45	2½	1½	1 3-16	1⅜	124	0 15½
Number 46	2¾	1⅝	1 5-16	1½	80	0 15½
Number 47	3	1¾	1 7-16	1⅝	76	0 16
Number 48	3¼	1⅞	1 9-16	1¾	60	0 16
Number 49	3½	2	1 11-16	1⅞	50	0 17
Number 50	3½	2	1 13-16	2	48	0 17

Sizes not enumerated on above lists will be charged extra, at discretion of the Manufacturer.

MACHINE SCREWS, OVAL AND FLAT HEAD.

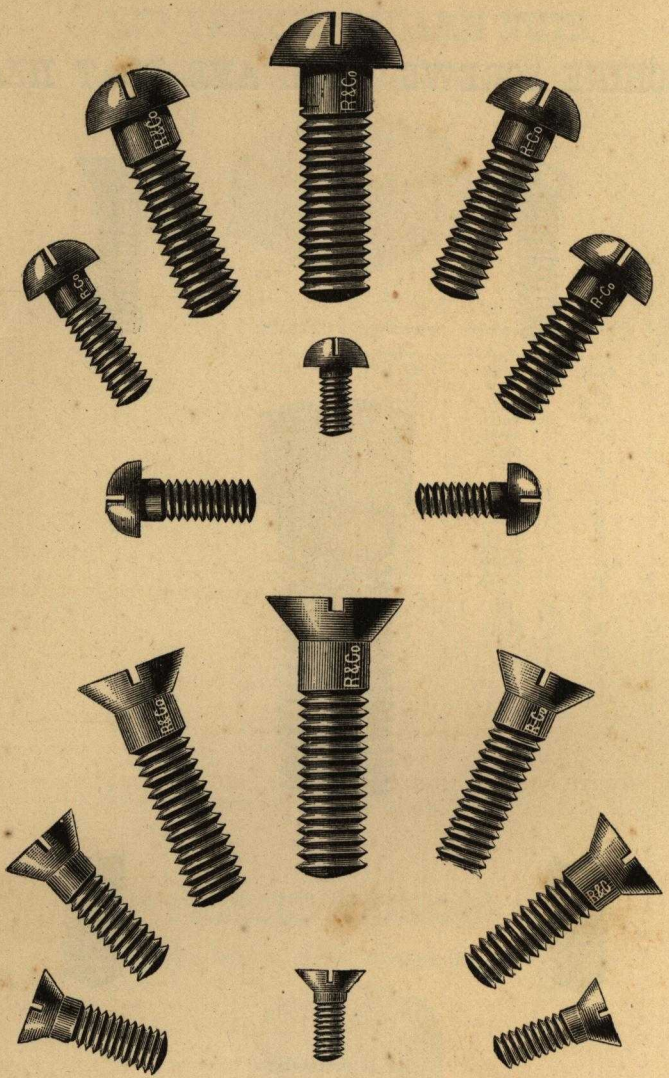


PER GROSS.

Numbers	4	6	8	10	12	14	16	18	20	24
Length	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
¼	55	55	65							
5-16	55	55	65							
⅜	55	55	65	75	85	95				
½	55	55	65	75	85	95	105	115	120	
⅝			65	75	85	95	105	115	120	
¾			65	75	85	95	105	120	125	150
⅞				85	95	105	110	125	130	160
1				95	95	110	115	130	135	170
1¼					100	120	125	135	145	190
1½						130	135	145	160	200
Threads	32	32	30 & 32	24 & 30	20 & 24	20 & 24	16 & 18	16 & 18	16 & 18	16

On Machine Screws made to order differing in length, size, thread or head from our regular standard Flat and Round Head Screws, special prices will be given on application. Brass and Filister Heads made to order at special prices.

ROUND HEAD MACHINE SCREWS, FINISHED HEADS.

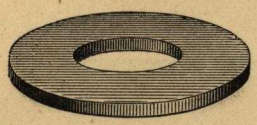


PER HUNDRED.

Diameter of Head	13-64	9-32	⅜	7-16	17-32	19-32	23-32	25-32	27-32	31-32
Length of Head	7-64	3-16	¼	9-32	5-16	11-32	⅜	7-16	½	9-16
Diameter of Screw	⅛	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾
Length under Head to Point. ¾	$2 00	2 25	2 50	3 00	3 50	4 00	5 00			
1	2 25	2 50	2 75	3 25	3 75	4 25	5 30	6 60		
1¼		2 75	3 00	3 50	4 00	4 50	5 60	6 90	9 00	
1½			3 25	3 75	4 25	4 75	5 90	7 20	9 50	12 00
1¾				4 00	4 50	5 00	6 20	7 50	10 00	12 50
2					4 75	5 25	6 50	7 80	10 50	13 00
2¼						5 50	6 80	8 10	11 00	13 50
2½							7 10	8 40	11 50	14 00
2¾								8 70	12 00	14 50
3									12 50	15 00
Number of Threads	36	24	20	18	16	14	12 & 13	12	11	10

These Screws are all milled from the bar, and the heads are all parallel with the bodies, as from the way they are made it would be impossible for them to be otherwise. Shoulder and Thumb Screws made to order.

WASHERS.



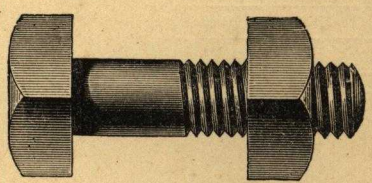
200 POUND KEGS.

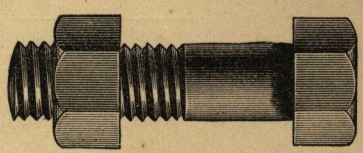
DIAMETER.	Size of Hole.	Thickness Wire Gauge.	Size of Bolt.	Price per lb.
⅝ inch	¼	16	3-16	$0 25
¾ "	5-16	16	¼	0 19
⅞ "	⅜	16	5-16	0 17
1 "	7-16	14	⅜	0 15
1¼ "	½	14	7-16	0 13
1⅜ "	9-16	14	½	
1½ "	⅝	11	9-16	
1⅝ "	11-16	11	⅝	
1⅞ "	13-16	11	¾	
2¼ "	15-16	10	⅞	0 12½
2⅛ "	1⅛	10	1	
2¾ "	1¼	8	1⅛	
3 "	1⅜	8	1¼	
3¼ "	1½	8	1⅜	0 13¾

Washers of irregular sizes, made to order, will be charged extra, at discretion of the manufacturer.

MACHINE BOLTS,

WITH SQUARE HEADS AND NUTS, FINISHED POINTS.





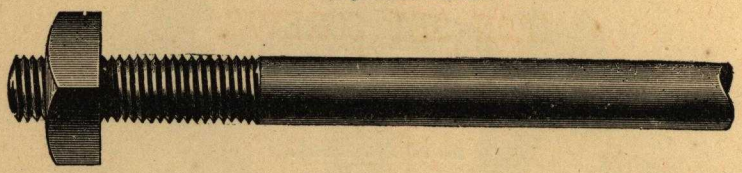
PRICE PER HUNDRED.

LENGTH.	¼	5-16	⅜	7-16	½	9-16 & ⅝	¾	⅞
1½ inch	$2 80	3 20	3 60	4 60	5 00	7 20	10 50	14 90
2 "	2 90	3 35	3 80	4 90	5 30	7 70	11 10	15 80
2½ "	3 00	3 50	4 00	5 20	5 60	8 20	11 70	16 60
3 "	3 10	3 65	4 20	5 50	5 90	8 70	12 30	17 50
3½ "	3 20	3 80	4 40	5 80	6 20	9 20	12 90	18 30
4 "	3 30	3 95	4 60	6 10	6 50	9 70	13 50	19 20
4½ "	3 40	4 10	4 80	6 40	6 80	10 20	14 10	20 00
5 "	3 50	4 25	5 00	6 70	7 10	10 70	14 70	20 90
5½ "	3 60	4 40	5 20	7 00	7 40	11 20	15 30	21 70
6 "	3 70	4 55	5 40	7 30	7 70	11 70	15 90	22 60
6½ "	3 80	4 70	5 60	7 60	8 00	12 20	16 50	23 40
7 "	3 90	4 85	5 80	7 90	8 30	12 70	17 10	24 30
7½ "	4 00	5 00	6 00	8 20	8 60	13 20	17 70	25 10
8 "	4 10	5 15	6 20	8 50	8 90	13 70	18 30	26 00
9 "	....	....	6 60	9 10	9 50	14 75	19 50	27 70
10 "	....	....	7 00	9 70	10 10	15 75	20 70	29 40
11 "	....	....	7 40	10 30	10 70	16 75	21 90	31 10
12 "	....	....	7 80	10 90	11 30	17 75	23 10	32 80
13 "	....	....	....	.....	11 90	18 75	24 30	34 50
14 "	....	....	....	.....	12 50	19 75	25 50	36 20
15 "	....	....	....	.....	13 10	20 75	26 70	37 90
16 "	....	....	....	.....	13 70	21 75	27 90	39 60
17 "	....	....	....	.....	14 30	22 75	29 10	41 30
18 "	....	....	....	.....	14 90	23 75	30 30	43 00
19 "	....	....	....	.....	15 50	24 75	31 50	44 70
20 "	....	....	....	.....	16 10	25 75	32 70	46 40

Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent. extra.
If both Hexagon Heads and Hexagon Nuts, 20 per cent. extra.
Bolts with Square Necks charged extra.
Bolts of irregular shape or style, made to order, will be charged extra, at our discretion.

BOLT ENDS,

WITH SQUARE NUTS.



PRICE PER POUND.

Size	5-16	⅜	7-16	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2
Length, inches	6	7	7	8	9	10	11	12	0 13	14	15	16	17	18	19	20
Per lb	$0 28	0 24	0 20	0 16	0 14	0 12				0 14			0 16			

FORGED SET SCREWS AND TAP BOLTS,

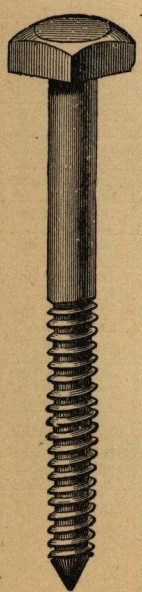
WITH SQUARE HEADS. PRICE PER 100.

Length.	¼	5-16	⅜	7-16	½	9-16 & ⅝	¾
1½	$2 50	2 80	3 30	3 90	4 50	6 60	8 90
1¾	2 60	2 90	3 40	4 00	4 70	6 80	9 20
2	2 70	3 00	3 50	4 10	4 90	7 00	9 50
2¼	2 80	3 10	3 60	4 20	5 10	7 20	9 80
2½	2 90	3 20	3 70	4 30	5 30	7 40	10 10
2¾	3 00	3 30	3 80	4 40	5 50	7 60	10 40
3	3 10	3 40	3 90	4 50	5 70	7 80	10 70

With Hexagon Heads, 10 per cent. extra.

LAG SCREWS,

BLUNT OR GIMLET POINTS. PRICE PER 100.



Length.	5-16	⅜	7-16	½	9-16 & ⅝	¾	⅞	1
1½ inch	$2 70	$3 10	$4 00	$4 30	.....	.....	....	.....
2 inch	2 90	3 30	4 25	4 60	$6 50	.....	.....	.....
2½ inch	3 10	3 50	4 50	4 90	6 90	$10 00	.....	.....
3 inch	3 30	3 70	4 75	5 20	7 30	10 50	$15 00	.....
3½ inch	3 50	3 90	5 00	5 50	7 70	11 00	15 75	$21 60
4 inch	3 70	4 10	5 25	5 80	8 10	11 50	16 50	22 50
4½ inch	3 90	4 30	5 50	6 10	8 50	12 00	17 25	23 40
5 inch	4 10	4 50	5 75	6 40	8 90	12 50	18 00	24 25
5½ inch	4 30	4 70	6 00	6 70	9 30	13 00	18 75	25 25
6 inch	4 50	4 90	6 25	7 00	9 70	13 50	19 50	26 25
7 inch	....	.....	6 75	7 60	10 50	14 50	21 00	28 25
8 inch	.....	.....	7 25	8 20	11 30	15 50	22 50	30 25
9 inch	....	.....	7 75	8 80	12 10	16 50	24 00	32 25
10 inch	.....	.....	.....	9 40	12 90	17 50	25 50	34 25
11 inch	.....	.....	.....	10 00	13 70	18 50	27 00	36 25
12 inch	....	.....	....	10 60	14 50	19 50	28 50	38 25

IRON SET SCREWS.

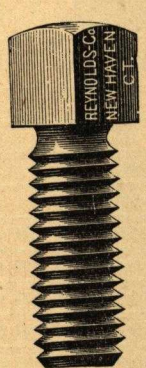
CASE HARDENED—PER HUNDRED.

Diameter of Screw.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1
Length under Head to Point. ¾	$2 00	2 20	2 50	2 90	3 40	4 00	4 75	.....	.....	.....
1	2 15	2 35	2 65	3 10	3 60	4 25	5 00	6 50	.....	.....
1¼	2 30	2 50	2 80	3 30	3 80	4 50	5 25	7 00	9 60	.....
1½	2 45	2 65	2 95	3 50	4 00	4 75	5 50	7 50	10 25	13 50
1¾	2 60	2 80	3 10	3 70	4 20	5 00	5 75	8 00	10 90	14 40
2	2 75	2 95	3 25	3 90	4 40	5 25	6 00	8 50	11 55	15 30
2¼	.....	3 10	3 40	4 10	4 60	5 50	6 25	9 00	12 20	16 20
2½	.....	.....	3 55	4 30	4 80	5 75	6 50	9 50	12 85	17 10
2¾	.....	.....	.....	4 50	5 00	6 00	6 75	10 00	13 50	18 00
3	.....	.....	.....	.....	5 20	6 25	7 00	10 50	14 15	18 90
Threads to Inch.	20	18	16	14	12	12	11	10	9	8

Add for all Screws over 3 inches in length same rate of difference per ¼ inch in length as preceding figures in same column. We can make these 9 inches long.

STEEL SET SCREWS.

POINT TEMPERED—PER HUNDRED.

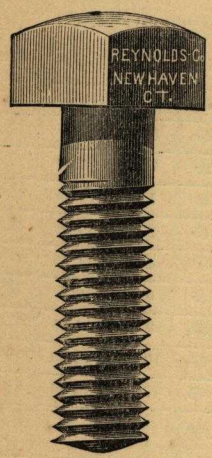


Diameter of Screw.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1
Length under Head to Point. ¾	$4 80	5 30	6 00	6 95	8 15	9 60	11 40	.....	.....	.....
1	5 15	5 65	6 35	7 45	8 65	10 20	12 00	15 60	.....	.....
1¼	5 50	6 00	6 70	7 95	9 15	10 80	12 60	16 80	23 05	.....
1½	5 85	6 35	7 05	8 45	9 65	11 40	13 20	18 00	24 60	32 40
1¾	6 20	6 70	7 40	8 95	10 15	12 00	13 80	19 20	26 15	34 55
2	6 60	7 05	7 75	9 45	10 65	12 60	14 40	20 40	27 70	36 70
2¼	.....	7 40	8 10	9 95	11 15	13 20	15 00	21 60	29 25	38 85
2½	.....	.....	8 45	10 45	11 64	13 80	15 60	22 80	30 80	41 00
2¾	.....	.....	.....	10 95	12 15	14 40	16 20	24 00	32 35	43 15
3	.....	.....	.....	.....	12 65	15 00	16 80	25 20	33 90	45 30
Threads to Inch.	20	18	16	14	12	12	11	10	9	8

State with each order whether the Screws are to be tempered or not. Add for all Screws over 3 inches in length, same rate of difference per ¼ inch in length as preceding figures in same column. We can make these 9 inches long.

SQUARE HEAD CAP SCREWS.

PER HUNDRED.

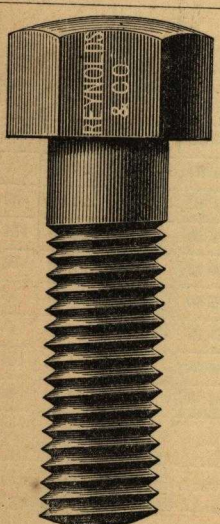


Diameter of Head.		7-16	½	9-16	⅝	11-16	¾	⅞	1	1⅛
Length of Head.		⅜	7-16	9-16	⅝	11-16	¾	⅞	⅞	1
Diameter of Screw.		5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1
Length under Head to Point.	¾	2 50	2 90	3 40	4 00	4 75	.....	.....	.....	.....
	1	2 65	3 10	3 60	4 25	5 00	6 50	.....	.....	.....
	1¼	2 80	3 30	3 80	4 50	5 25	7 00	9 00	.....	.....
	1½	2 95	3 50	4 00	4 75	5 50	7 50	9 50	12 75	.....
	1¾	3 10	3 70	4 20	5 00	5 75	8 00	10 00	13 40	15 85
	2	3 25	3 90	4 40	5 25	6 00	8 50	10 50	14 05	16 70
	2¼	3 40	4 10	4 60	5 50	6 25	9 00	11 00	14 70	17 55
	2½	.....	4 30	4 80	5 75	6 50	9 50	11 50	15 35	18 40
	2¾	.....	.....	5 00	6 00	6 75	10 00	12 00	16 00	19 25
	3	.....	.....	.....	6 25	7 00	10 50	12 50	16 65	20 10
Threads to Inch.		18	16	14	12	12	11	10	9	8

Add for all Screws over 3 inches in length same rate of difference per ¼ inch in length as preceding figures in same column. We can make them 9 inches long.

HEXAGON HEAD CAP SCREWS.

PER HUNDRED.



Diameter of Head.		5-16	½	⅝	¾	11-16	⅞	1 1-16	1⅛	1¼
Length of Head.		5-16	½	⅝	¾	11-16	⅞	1 1-16	1⅛	1¼
Diameter of Screw.		5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1
Length under Head to Point.	¾	3 25	3 75	4 40	5 30	6 50	.....	.....	.....	.....
	1	3 50	4 00	4 70	5 60	7 00	9 00	.....	.....	.....
	1¼	3 75	4 25	5 00	5 90	7 50	9 50	11 50	.....	.....
	1½	4 00	4 50	5 30	6 20	8 00	10 00	12 00	16 00	.....
	1¾	4 25	4 75	5 60	6 50	8 50	10 50	12 50	16 50	21 05
	2	4 50	5 00	5 90	6 80	9 00	11 00	13 00	17 00	22 10
	2¼	4 75	5 25	6 20	7 10	9 50	11 50	13 50	17 50	23 15
	2½	.....	5 50	6 20	7 40	10 00	12 00	14 00	18 00	24 20
	2¾	.....	.....	6 80	7 70	10 50	12 50	14 50	18 50	25 25
	3	.....	.....	.....	8 00	11 00	13 00	15 00	19 00	26 30
Threads to Inch.		18	16	14	12	12	11	10	9	8

Add for all Screws over 3 inches in length same rate of difference per ¼ inch in length as preceding figures in same column. We can make these 9 inches long.

JACK SCREWS,

WITH IRON STANDS AND WROUGHT IRON SCREWS.

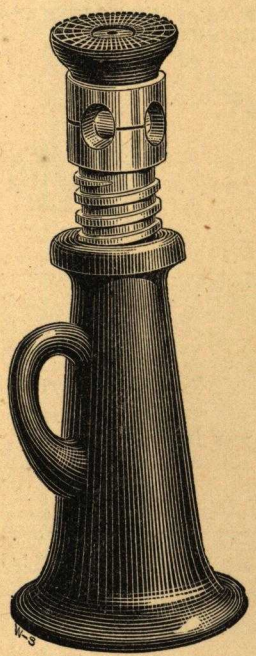


Fig. 225.

Fig. 225 represents our Wrought Iron Jack Screws, with Cast Iron Stands, as shown in the cut annexed. This arrangement renders the article complete in itself, dispensing with the blocks ordinarily used, and will be found much more convenient in every sense than the old kind of Jack Screws.

SIZES AND PRICES.

DIAMETER.	Height of Stand.	Length of Screw.	Thread Cut.	Raise.	Price.
1½ inch.	9 inch.	13 inch.	9 inch.	7 inch.	$ 4 00
2 inch.	13 inch.	17 inch.	13 inch.	10 inch.	6 00
2½ inch.	15 inch.	19 inch.	15 inch.	12 inch.	9 50
3 inch.	17 inch.	21 inch.	17 inch.	14 inch.	14 00

LOCOMOTIVE SCREWS,

WITH CAST IRON STANDS AND WROUGHT IRON SCREWS, NICELY TURNED AND FITTED.

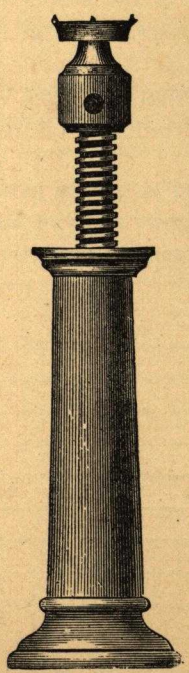


Fig. 226.

Fig. 226 represents our Locomotive Screw, made with an Iron Stand and Swivel Top, and is extensively used in repairing Locomotives and various kinds of machinery, and possessing an advantage over others in the fact that they are easily adjusted under the part to be raised, and require nothing beside their own structure for successful usage.

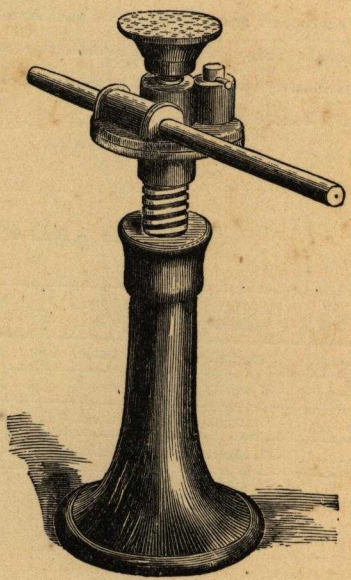
SIZES AND PRICES.

DIAMETER.	Height of Stand.	Length of Screw.	Thread Cut.	Raise.	Price.
1½ inch.	14 inch.	18 inch.	14 inch.	11 inch.	$ 4 50
2 inch.	16 inch.	20 inch.	16 inch.	13 inch.	7 00
2½ inch.	17 inch.	21 inch.	17 inch.	15 inch.	11 00

KNOWLES' PATENT RATCHET JACK SCREWS,

FOR RAISING BUILDINGS AND MOVING HEAVY BODIES; ALSO, SUCH AS ARE ADAPTED TO THE USE OF RAILROAD COMPANIES TO RAISE AND REPLACE CARS AND LOCOMOTIVES.

Fig. 224.



These Jack Screws are made with special reference to strength and durability; great care is taken in the construction of the thread, thereby reducing the friction to its least possible amount. This Patent Jack Screw is so arranged that it can be turned and operated in the most difficult places in the smallest amount of space, as it can be rotated by simply vibrating the lever a few inches.

Great objection has been made to Ratchet Jacks on account of their being restricted to the length of lever, and that of the one provided with it. This Ratchet can be operated with any kind of lever, as well as with the one furnished.

By reference to the accompanying cut, it will be seen that the lever can be passed part way or entirely through the head of the Jack as readily as with the common screw, and can also be turned without removing the lever from its place. This is of great importance in almost every place, and especially in raising buildings.

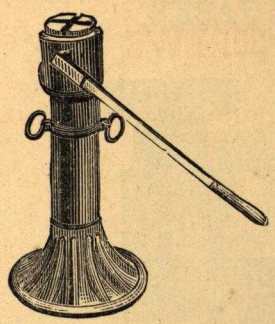
It needs only to be tried to be appreciated and adopted in every case.

PRICE LIST.

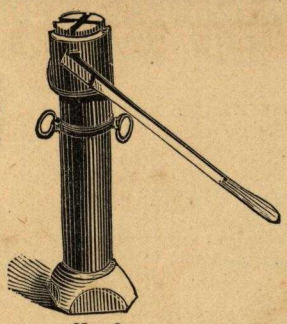
1¼ inch Screw, 8 inch Barrel	$ 6 00
1¾ inch Screw, 10 inch Barrel	8 00
2 inch Screw, 12 inch Barrel	10 00
2½ inch Screw, 15 inch Barrel	15 00
2¾ inch Screw, 20 inch Barrel	20 00

Other sizes made to order.

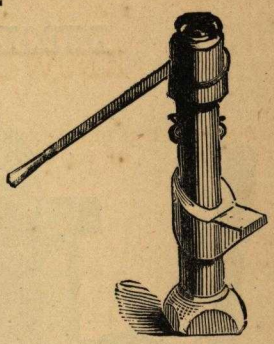
DUDGEON'S HYDRAULIC JACKS.



No. 1.



No. 2.



No. 3.

DESCRIPTION.

This Jack or Press appears to the eye, when depressed, a simple cylinder, and when elevated, one cylinder sliding within another. It is from two to eight or more inches in diameter, according to the power desired, with an enlarged head (attached to the inner cylinder, which is the ram), having a socket for the reception of the lever by which the force-pump is worked. The ram, with its head, contains just so much fluid as is required to fill the vacancy in the cylinder, caused by the raising of the ram in the act of lifting; and when this is accomplished, the water is returned into its original recess by a valve operated by the lever that works the pump. The force-pump and valves are contained inside the ram. The lever is detached, and may be put on at pleasure.

The ground-lifting attachment is a tube screwed into the lower side of the head, and passing down to the bottom of the press, outside of the cylinder, on the lower end of which is a claw that supports the weight to be raised.

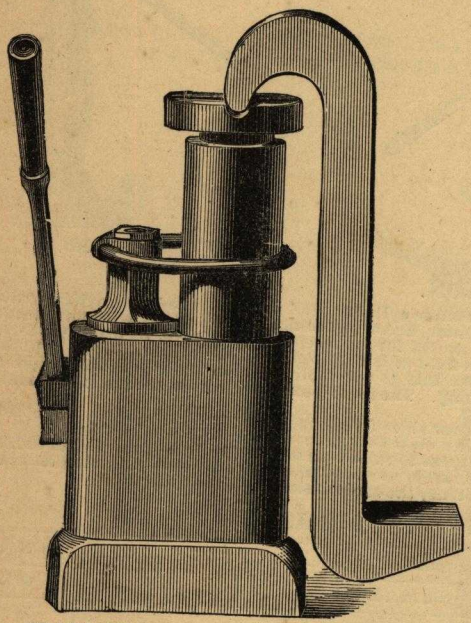
These Jacks are light, portable and of easy application, a press to raise four tons not weighing more than 50 lbs., and one to raise sixty tons, 200 lbs. They are all worked by the labor of one man, who is capable of raising ten tons, through a space of one foot, in one-and-a-half minutes, or sixty tons, the same distance, in ten minutes.

SIZES AND PRICES OF HYDRAULIC JACKS.

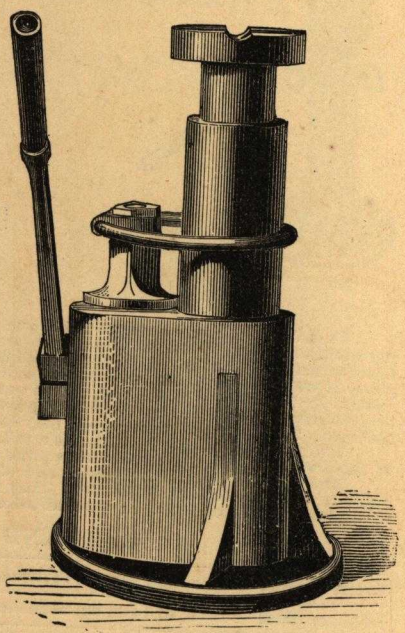
To lift or press 4 tons, and run out 12 inches, and lift from the ground	$ 60 00
To lift or press 4 tons, and run out 24 inches, and lift from the ground	65 00
To lift or press 7 tons, and run out 12 inches	70 00
To lift or press 7 tons, and run out 24 inches	75 00
To lift or press 7 tons, and run out 12 inches, and lift from the ground	85 00
To lift or press 7 tons, and run out 12 inches, with wide base for locomotive shops	80 00
To lift or press 7 tons, and run out 18 inches, with wide base for locomotive shops	85 00
To lift or press 7 tons, and run out 24 inches, and lift from the ground	90 00
To lift or press 10 tons, and run out 12 inches	80 00
To lift or press 10 tons, and run out 18 inches	100 00
To lift or press 10 tons, and run out 12 inches, and lift from the ground	100 00
To lift or press 10 tons, and run out 12 inches, with wide base for locomotive shops	95 00
To lift or press 10 tons, and run out 18 inches, with wide base for locomotive shops	110 00
To lift or press 15 tons, and run out 12 inches	100 00
To lift or press 15 tons, and run out 12 inches, with wide base for locomotive shops	125 00
To lift or press 15 tons, and run out 12 inches, and lift from the ground	150 00
To lift or press 15 tons, and run out 18 inches, with wide base for locomotive shops	150 00
To lift or press 20 tons, and run out 12 inches, and lift from the ground	200 00
To lift or press 20 tons, and run out 12 inches, with wide base for locomotive shops	150 00
To lift or press 20 tons, and run out 12 inches	120 00
To lift or press 30 tons, and run out 9 inches	150 00
To lift or press 30 tons, and run out 12 inches	175 00
To lift or press 30 tons, and run out 9 inches, with wide base for locomotive shops	170 00
To lift or press 30 tons, and run out 12 inches, with wide base for locomotive shops	200 00
To lift or press 30 tons, and run out 12 inches, and lift from the ground	250 00
To lift or press 60 tons, and run out 9 inches, with cistern and force-pump outside	250 00
To lift or press 60 tons, and run out 12 inches	275 00
To lift or press 90 tons, and run out 9 inches, with cistern and force-pump outside	350 00
To lift or press 90 tons, and run out 12 inches	375 00
To lift or press 100 tons, and run out 12 inches	400 00
To lift or press 120 tons, and run out 7 inches	450 00

Larger sizes made to order.

DUDGEON'S HORIZONTAL HYDRAULIC JACKS.



CLAW, OR GROUND-LIFTING JACK.

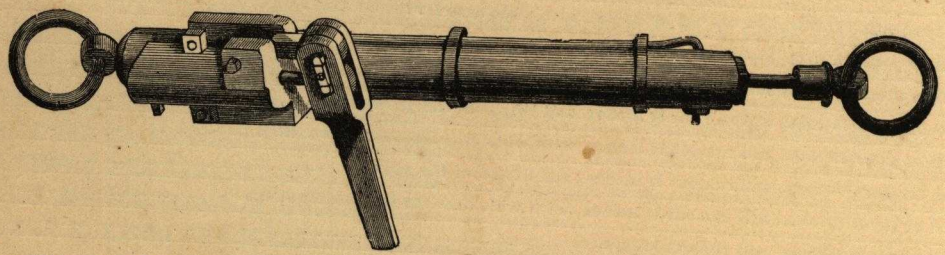


BROAD BASE, OR LOCOMOTIVE JACK.

10, 15 or 20 tons of this style, to run out two feet, made to order.

These Jacks run out their entire length, horizontal or vertical, and will run out six inches further than the old kind (see page 321), while standing the same height, that is to say, a Jack to run out eighteen inches will measure little if any more (when down) than one that runs out twelve inches. The claw comes much nearer the ground, is made of wrought iron, and can be taken off when not needed; they are less liable to get out of order, are easily repaired, and are considered a far superior Jack by all who have used them. Prices and sizes same as the old kind.

HYDRAULIC PULLING JACKS.



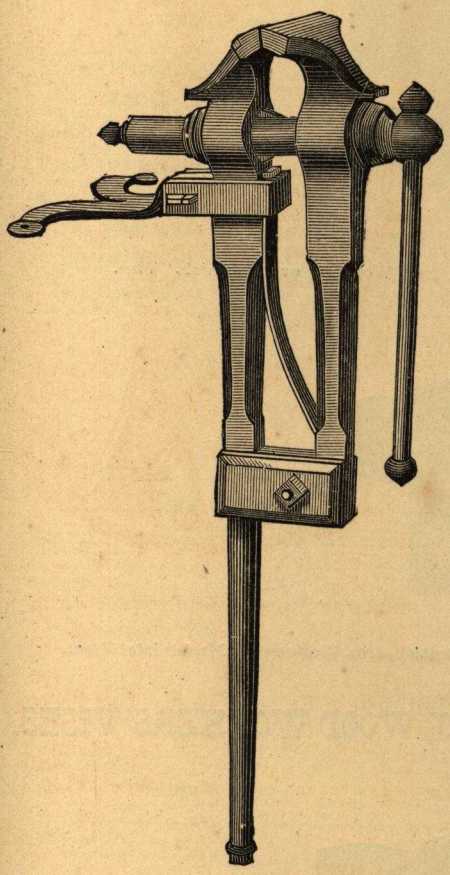
These Hydraulic Pulling Jacks are for stretching rigging, testing chains and ropes, pulling stumps, hoisting heavy weights, etc., in engine rooms or other places, especially where there is but little space.

These Jacks differ from the others by their being extended when commencing to work, and then being pumped together. The force-pump is attached to the side, and is worked by a lever, the same as the Hydraulic Jack.

SIZES AND PRICES.

To stretch 2 feet and pull 8 tons	$200 00
To stretch 2 feet and pull 10 tons	240 00
To stretch 2 feet and pull 15 tons	300 00
To stretch 2 feet and pull 20 tons	350 00
To stretch 2 feet and pull 30 tons	450 00

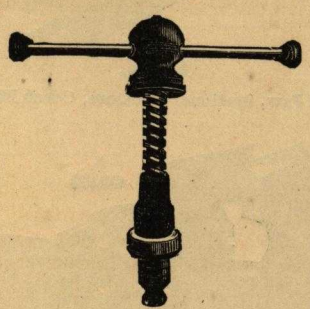
SOLID BOX VISE.



PRICE LIST.

No. 35, Vise weighing about 35 lbs. each	$ 8 50
" 40, " " " 40 " "	9 50
" 45, " " " 45 " "	10 00
" 50, " " " 50 " "	11 00
" 55, " " " 55 " "	12 00
" 60, " " " 60 " "	13 00
" 65, " " " 65 " "	14 00
" 70, " " " 70 " "	15 00
" 75, " " " 75 " "	16 00
" 80, " " " 80 " "	17 50
" 85, " " " 85 " "	18 50
" 90, " " " 90 " "	20 00
" 95, " " " 95 " "	21 00
" 100, " " " 100 " "	22 00
" 105, " " " 105 " "	23 00
" 110, " " " 110 " "	24 00
" 115, " " " 115 " "	25 00
" 120, " " " 120 " "	26 00
" 125, " " " 125 " "	27 50
" 130, " " " 130 " "	29 00
" 135, " " " 135 " "	31 50
" 140, " " " 140 " "	33 00
" 145, " " " 145 " "	35 00
" 150, " " " 150 " "	36 00
" 160, " " " 160 " "	41 50
" 170, " " " 170 " "	44 50
" 180, " " " 180 " "	47 00
" 190, " " " 190 " "	53 00
" 200, " " " 200 " "	56 00

SOLID BOX, VISE BOXES AND SCREWS.



30 to 40 lb. Vise, 1⅛ in. Screw, 1¼ in. diam. Box, each	$3 50
40 to 55 lb. Vise, 1¼ in. Screw, 1⅜ in. diam. Box, each	4 00
55 to 75 lb. Vise, 1⅜ in. Screw, 2 in. diam. Box, each	4 50
75 to 95 lb. Vise, 1½ in. Screw, 2⅛ in. diam. Box, each	5 50
95 to 125 lb. Vise, 1⅝ in. Screw, 2¾ in. diam. Box, each	7 00

PRENTISS' PATENT IRON WORKERS' VISES.

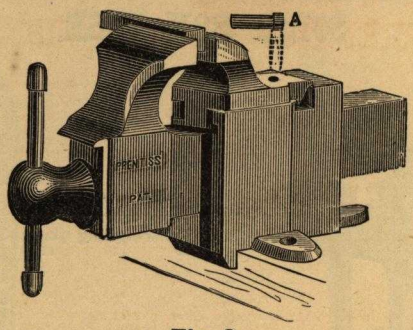


Fig. 3.

Fig. 3 represents our Adjustable Jaw, Stationary Bottom, Iron Workers' or Machinists' Vise.

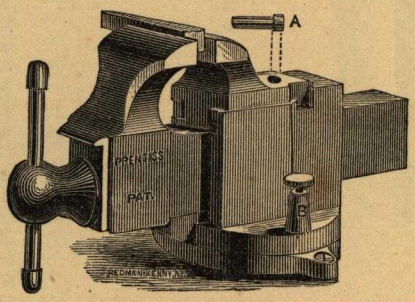


Fig. 4.

Fig. 4 represents a view of our Adjustable Jaw, Patent Swivel Bottom, Iron Workers' or Machinists' Vise.

PRENTISS' PATENT COACH MAKERS' OR WOOD WORKERS' VISES.

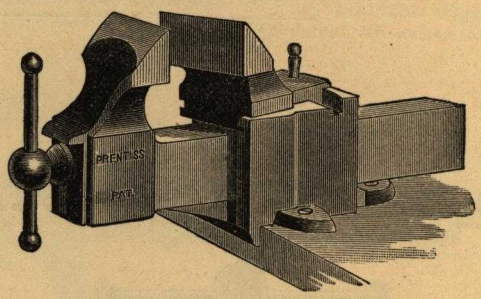


Fig. 5.

Fig. 5 represents our Adjustable Jaw, Stationary Bottom, Coach Makers' or Wood Workers' Vise.

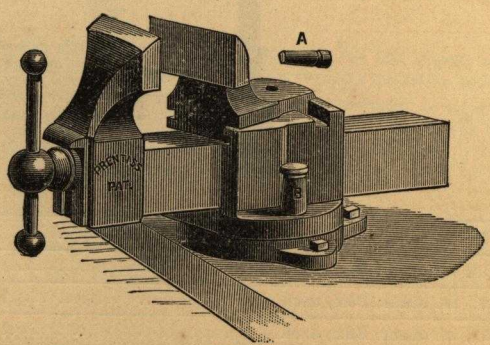


Fig. 6.

Fig. 6 is a cut of our Adjustable Jaw, Patent Swivel Bottom, Coach Makers' or Wood Workers' Vise.

PRENTISS' PATENT VISES.

Width of Jaw.	Weight. Stationary Vise.	Weight. Swivel Vise.	Opens.	Price. Stationary Vise.	Price. Swivel Vise.
1¼ inch (Watch-Makers')	2 lbs.	2¾ lbs.	1¼ in.	$ 3 50	$ 4 50
2 inch (Jewelers')	3½ lbs.	4½ lbs.	2 in.	4 00	5 00
2⅝ inch ("Amateur")	13½ lbs.	17 lbs.	3½ in.	5 50	6 75
3½ inch (Machinists')	28 lbs.	32 lbs.	4¾ in.	7 00	8 50
4½ inch (Machinists')	54 lbs.	65 lbs.	6 in.	10 50	12 50
5¼ inch (Machinists')	96 lbs.	109 lbs.	8 in.	17 00	19 00
6 inch (Machinists')	146 lbs.	168 lbs.	9 in.	24 00	27 00
7 inch (Machinists')	184 lbs.	207 lbs.	11 in.	30 00	35 00

COACH-MAKERS' OR WOOD-WORKERS' VISES.

Width of Jaw.	Weight. Stationary Bottom.	Weight. Swivel Bottom.	Opens.	Price. Stationary Bottom.	Price. Swivel Bottom.
3½ inch	30 lbs.	34 lbs.	7 in.	$ 8 00	$ 9 50
4½ inch	59 lbs.	67 lbs.	9½ in.	11 00	13 00

FINISHING OR FILERS' VISE.

Width of Jaw.	Weight. Stationary Bottom.	Weight. Swivel Bottom.	Opens.	Price. Stationary Bottom.	Price. Swivel Bottom.
4 inch	32 lbs.	36 lbs.	5 inch.	$ 8 00	$ 10 00

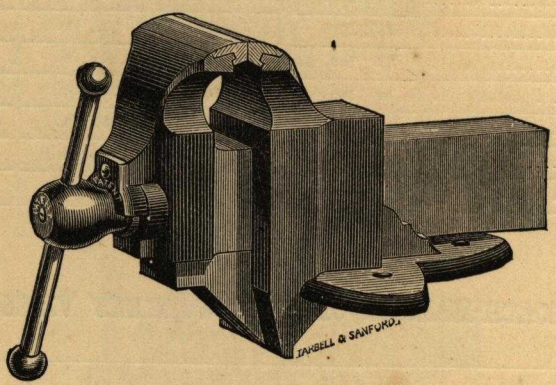
VISE CLAMP FOR TABLE OR VESSEL RAIL.

1¼ inch Swivel Vise	$ 0 75
2 inch Swivel Vise	0 85
2⅝ inch Swivel Vise	1 50
3½ inch Swivel Vise	2 00
4½ inch Swivel Vise	2 50
5¼ inch Swivel Vise	3 00

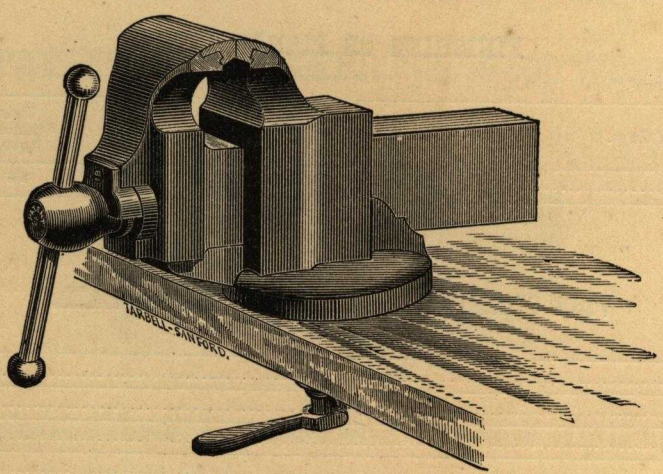
EXTRA FOR NICKEL-PLATING WATCH-MAKERS' AND JEWELERS' VISES.

1¼ inch Vises	$ 2 25
2 inch Vises	2 50
Clamps for same	1 00

PARKER'S PATENT VISES.



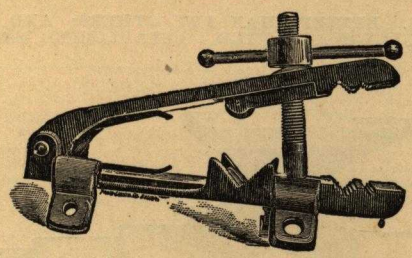
PARALLEL.



SWIVEL.

Length Jaw.....	1¾	2¼	3½	3¼	3⅝	4¼	4¾	5⅜	6⅛	8⅛
Parallel.....	.....	.....	.....	$6 25	7 00	9 00	11 75	16 25	24 00	50 00
Swivel.....	$ 4 00	5 00	7 00	.....	8 75	11 00	14 50	.....	.....	.....

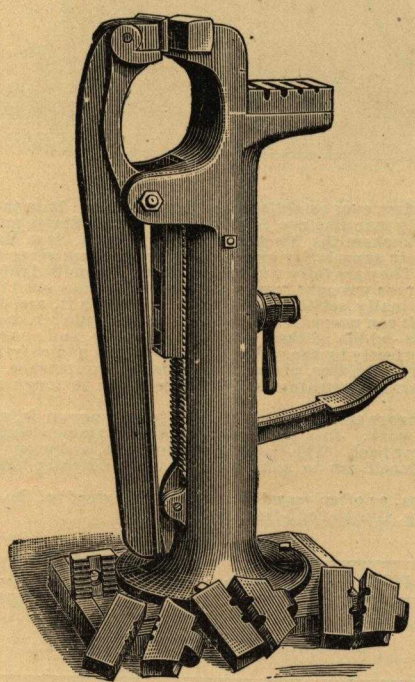
GLAZIER'S PORTABLE PIPE VISE.



In presenting this Vise to the trade, we think a long felt want is fully met; that is, to have a Vise and Pipe Cutter combined, and, at the same time, made in such a form as to be easily carried from place to place. Such an article is found in Glazier's Portable Pipe Vise, which is manufactured of cast steel, with a thoroughly tested cutter wheel, and is easily adjusted to any bench or post where a man can work.

Size A takes from ⅛ to 1 inch Pipe	$ 8 00
Size B takes from ⅛ to 2 inch Pipe	10 00

FOOT VISE.



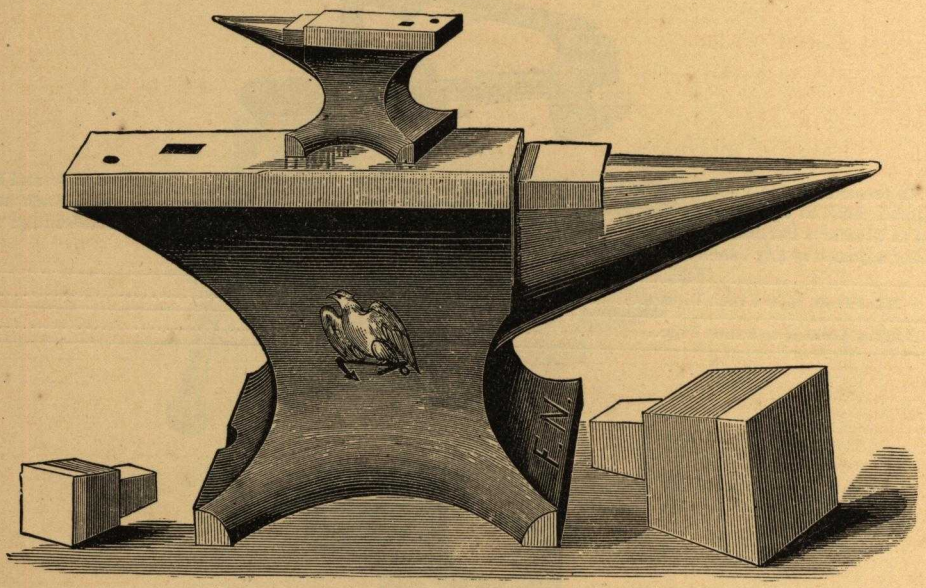
Shoe Calks can be made sharp or square for winter or summer use, and the dies are so shaped that the calks are better formed than they can be in the ordinary way, and from two to three times as many as can be in the old way. By a peculiar arrangement of the dies they adjust themselves to the shoe, no matter whether it is thick or thin, tapering or straight, and do not hold the shoe by corner of the dies, as would be the case with any other arrangement. The Anvil attachment has grooves or dies for welding different sizes of sharp calks. There are Dies for making bolt heads on the following sizes of iron, from 1⅛ inch to 21 inches long: ¼, 5-16, ⅜, 7-16, ½, ⅝ and ¾ inches; and dies for forming shoe calks and other work. The Dies can be changed quickly.

PRICES.

Without Bolt Heading Dies	$23 00
Without Shoe Calking Dies	22 00
Complete	25 00

THE PATENT "EAGLE" ANVILS.

CHEAPER THAN ANY OTHERS. BETTER THAN ANY OTHERS; AND THE ONLY ONES THAT ARE FULLY WARRANTED. ESTABLISHED 1843.



The Eagle Anvil Works was the first ever established in this country. It is the only one that has continued for the past thirty-eight years to successfully manufacture Anvils in the United States and to warrant every one. The Eagle Anvils have been in general use by Blacksmiths, Machinists, File Makers, Saw Makers, and others, so long, and with such universal satisfaction, that their superiority over all others has long since been proved. Recent improvements make this superiority still greater. They are fully warranted. The "Peter Wright," and all anvils (except the Eagle), are made with a body and horn of fibrous wrought iron, and only for the face steel plates are welded on. By continued hammering, in use, this soft iron gradually settles, carrying the face with it, and the Anvil becomes hollowed on the face. Shear steel, also, is used, but it can never be made to take good temper like cast steel. The Eagle Anvil body is made of gun metal—crystallized iron—which neither settles nor breaks, and not only the face, but the horn, also, is of Best Tool Cast Steel, welded on so perfectly by the process of its original and only inventor, the late Mr. Mark Fisher, that it is warranted never to come off. The face, planed to a perfectly true surface, is made so hard that no hammer can make any impression on it, and it always remains so. The steel horn is tough and unhardened, and will not break or bend.

Every mechanic knows that the more solid a material used to hammer on is, and the less rebound to the hammer, the more effective the blow is on the work. Just in proportion as the hammer bounds back, so much labor is lost. All wrought iron anvils throw the hammer back. The Eagle Anvil does not, and every pound of his helper's sledge hammer is effective, while the blacksmith himself can do more work by using a lighter hand-hammer than he has been used to with an English Anvil.

Finally, the complaint of deafness, so often occasioned by the "ringing" of the anvil, is avoided by using the Eagle Anvil, which is warranted not to ring, like the old-fashioned kind.

Anvils, weighing 100 lbs. to 800 lbs., per lb	$0 10

SMALLER ANVILS ("MINIMS.")

Number	000	00	0	1	2	3	4	5	6	7	8	9
Weighing about	½ lb.	4 lb.	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
Price	$1 00	1 75	2 25	2 75	3 25	4 00	4 50	5 25	6 00	6 50	7 25	8 25

These are the Retail Prices. The only additional cost will be the freight to the purchaser's place of residence. The No. 000 is silver-plated, and is mailed postpaid to any part of the United States on receipt of the price.

EAGLE STAKES.

Number	1	2	3	4	5	6	7
Size of Face, square	2 in.	3 in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Price	$1 75	2 50	3 75	4 50	5 50	6 50	8 00

EAGLE ANVILS,

STANDARD DIMENSIONS.

BLACKSMITHS'.

Weight.	FACE.			HORN.
	Length.	Width.	Cutter-hole, Square.	Length.
Pounds.	Inches.	Inches.	Inches.	Inches.
100	11¾	3½	¾	7⅝
110	12¾	3½	¾	7⅝
120	12½	3¾	¾	8
130	13	3¾	¾	8
140	13⅜	4	⅞	8½
150	14	4	⅞	8½
160	14	4¼	1	9
170	14½	4¼	1	9
180	15	4¼	1	9¼
200	15¾	4¾	1	9¾
225	16½	4¾	1	9¾
250	17¼	5¼	1⅛	10½
275	17¾	5¼	1⅛	10½
300	18½	5¼	1⅛	10½
350	19½	6	1¼	11¾
400	21	6	1¼	11¾
450	22	6½	1⅜	13
500	23	6½	1⅜	14½

SMALL ANVILS (MINIMS).

No.	Weight.	FACE.			HORN.
		Length.	Width.	Cutter-hole. Square.	Length.
	Pounds.	Inches.	Inches.	Inches.	Inches.
000	⅛	2¼	⅛	..	1½
00	3	3¾	1½	..	2½
0	10	4¾	2	⅜	3
1	15	5½	2	⅜	3½
2	20	6¼	2½	½	4
3	30	7¼	2½	½	4
4	40	8¼	2¾	½	5¼
5	50	8¾	2¾	½	5¼
6	60	9¼	3	⅝	6½
7	70	10	3	⅝	6½
8	80	10½	3¼	⅝	6½
9	90	11	3¼	⅝	7½

CHAIN MAKERS'.

Number.	Weight.	Face.	Horn.
	Pounds.	Inches.	Inches.
No. 1.....	360	16x5¼	9
No. 2.....	90	9x3½	4½

SAW MAKERS'.

Weight.	FACE.		Height.
	Length.	Width.	
Pounds.	Inches.	Inches.	Inches.
75	9	4½	6
85	10	6	5
100	9	4½	8
140	10	6	8
170	10	4½	10½
190	10½	5¼	10½
200	9	6	10
210	11	5	11¼
220	12	4¼	12
250	11	6	12
260	12	12	6
300	13	6	11½
310	14	12	6½
350	15	5¼	13
360	12½	6½	13
500	14	7½	14
675	16	8	14½

AX MAKERS'.

Weight.	FACE.		Height.
	Length.	Width.	
Pounds.	Inches.	Inches.	Inches.
150	9½	4¾	10
225	12	4½	11½
260	14	4¾	11

FILE MAKERS'.

430	19½	5½	13

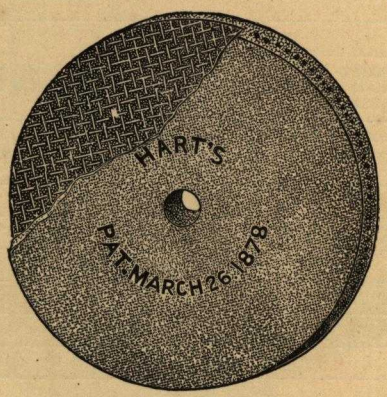
RAZOR MAKERS'.

320	12¾	6¼	13

CUTLERS'.

440	19 [HORN, 8 INCHES LONG.]	5½	14
300	17	5	12

HART EMERY WHEEL AND EMERY GRINDING MACHINERY.



The strongest and most serviceable wheel in use. Contains nothing but what has a cutting property. In ordering, state the kind of work you wish to do. Hart's Patent Wire Strengthening Web inserted in wheels without extra charge.

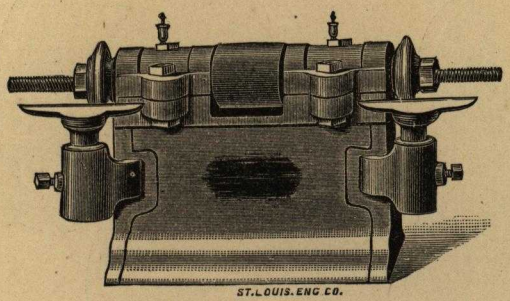
PRICE LIST.

Diam. in inches.	THICKNESS OF WHEELS, IN INCHES.												No. of Rev. per Minute.
	¼	½	¾	1	1¼	1½	1¾	2	2½	3	3½	4	
3	$0 50	0 75	0 95	1 10	1 25	1 35	1 45	1 60	1 85	2 10	2 60	3 00	7.400
4	80	1 10	1 35	1 60	1 90	2 20	2 50	2 75	3 25	3 85	4 60	5 00	5.450
5	1 00	1 40	1 80	2 10	2 60	3 00	3 45	3 80	4 65	5 40	6 40	7 40	4.400
6	1 40	1 75	2 50	3 05	3 70	4 30	5 00	5 60	6 90	8 25	9 50	11 00	3.600
7	1 85	2 30	3 15	3 95	5 00	5 60	6 40	7 25	8 90	10 55	11 10	12 60	3.150
8	2 12	2 60	3 60	4 50	5 70	6 40	7 60	8 30	10 20	12 05	14 00	16 00	2.750
9	.....	3 15	3 85	4 90	6 80	8 05	9 25	10 50	12 95	15 40	19 00	21 75	2.450
10	.....	3 70	5 10	6 60	8 10	9 50	11 00	12 40	15 35	18 15	21 00	23 80	2 200
12	.....	4 00	6 00	7 40	9 00	10 70	12 75	14 05	17 40	20 75	24 25	27 50	1.850
14	.....	6 20	8 70	10 70	13 25	15 20	17 80	19 50	24 20	26 75	28 70	30 70	1.600
16	.....	.....	11 00	13 70	16 90	19 40	22 00	25 00	30 80	36 50	43 00	48 75	1.400
18	.....	.....	13 75	17 00	21 75	24 50	28 75	32 00	39 50	47 00	54 50	62 00	1.250
20	.....	.....	.....	20 00	25 00	29 00	34 00	38 00	47 00	56 00	66 00	75 00	1 100
22	.....	.....	.....	.....	29 87	35 50	41 12	46 75	58 00	69 25	80 50	91 75	1.000
24	.....	.....	.....	.....	.....	43 00	50 00	57 00	71 00	85 00	99 00	113 00	0 925
30	.....	.....	.....	.....	.....	.....	.....	87 50	109 00	131 00	153 00	175 00	0.735

PRICE OF BEST TURKISH EMERY.

Kegs, per pound	$0 09
Half Kegs, per pound	0 10
Quarter Kegs, per pound	0 11
Cans, per pound	0 12

NO. 1. GRINDER.



The above engraving represents our new and improved Mounting for Emery Wheels. It is strong, stiff and compact, and arranged for bench use. It has self-oiling journal bearings, and may be run for three months without oiling, when once the oil chamber is filled. It has a bearing at each end of the shaft and flanged for two wheels. The power is applied to the pulley in the middle of the shaft, as represented, and hence a steady and even wear is imparted to the bearings or journals. The shaft is made of best refined machinery steel, 1 inch in diameter, and fitted for a wheel with a ¾ inch hole. It has two rests of a new design, and readily adjusted to the different diameters of wheel. Altogether, it is the most substantial and solid mounting now on the market, and, with the advantages above mentioned, has no equal. It will support a wheel from six to twelve inches in diameter, and is just the thing for small shops where light work is done, such as grinding machinists' tools, mill picks and gumming saws. No grit or dust can possibly reach the bearings, which are babbitted, as a recess or chamber extends all around both sides and ends of the bearings. The No. 1 is about as large and heavy as the Eastern size of that number, but at a price that brings it within the reach of all.

No. 1, complete for Bench	$25 00
Counter Shaft, with Driving Pulley, 4x2½, Speed Pulley, 14x2½	12 00

Wheels extra.

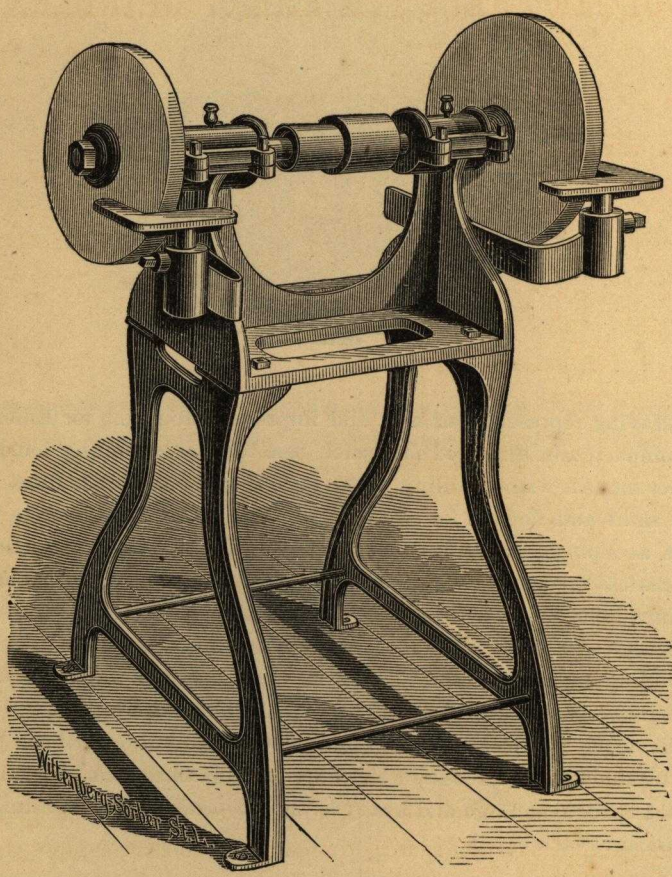
NO. 2. GRINDER.

No. 2 Machine is similar to No. 1; has 1¼ inch Steel Shaft, double bearing, self-oiling, babbitted boxes; will carry wheels from 6 to 14 inches in diameter.

Complete, for Bench use	$35 00
Counter Shaft	15 00

NO. 3 GRINDER,

ON FRAME.



The above engraving represents our New and Improved Mounting for Emery Wheels. It is arranged for either bench use, or mounted on a strong heavy frame, as represented above. It has a steel shaft 1½ inches in diameter and double bearings, also a pulley hung in middle of shaft. It is a double end machine, and, like the others, has patent self-oiling boxes.

PRICES.

No. 3 Machine, for Bench	$40 00
No. 3 Machine, on Frame	50 00

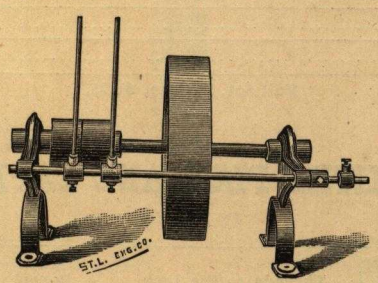
Counter Shaft and Wheels extra.

COUNTER SHAFT AND HANGERS, WITH SELF-OILING BOX.

Driving Pulley, 6x4, with Speed Pulley, 16x4	$25 00

COUNTER SHAFT FOR EMERY GRINDERS,

WITH ADJUSTABLE HANGERS AND SELF-OILING BOXES.



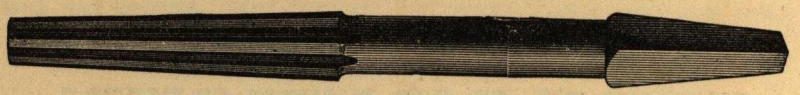
The above engraving represents a New and Improved Counter Shaft and Hangers. The Hangers have belt-shifting attachments and self-oiling boxes on the same plan as the bearings in the Grinding Machines. A constant source of annoyance is a counter shaft that is continually heating and cutting in the bearings; with this new device the trouble is entirely obviated, as it may be run for weeks or months without oiling.

PRICE LIST.

Driving Pulley, 4x4, Speed Pulley, 16x4	$25 00
Driving Pulley, 6x4, Speed Pulley, 16x4	28 00

Hangers only, with Self-oiling Boxes, $12 00.

TAPER REAMERS.



This Tool needs no explanation; every mechanic can see its advantages; it cuts and does not jam its way.

PRICES OF REAMERS.

¼ inch	$0 45
5-16 inch	0 50
⅜ inch	0 55
7-16 inch	0 60
½ inch	0 70
9-16 inch	0 80
⅝ inch	0 90
11-16 inch	1 05
¾ inch	1 20

Full Set, in Case, $6 75.

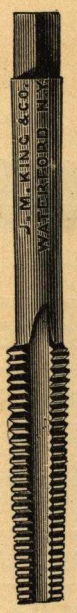
BLACKSMITHS' PLUG AND TAPER TAPS

IN BOXES.

Size	Hand.	Threads to the Inch	Taps in each Box.	Price, each Tap.
1½ inch	R	6, 7 & 8	2	$3 00
1⅜ inch	L	6, 7 & 8	2	3 00
1¼ inch	R	6, 7, 8 & 9	2	1 75
1¼ inch	L	8 & 9	2	1 75
1 inch	R	7, 8, 9 & 10	2	1 25
1 inch	L	8 & 9	2	1 25
7-8 inch	R	8, 9 & 10	4	0 90
7-8 inch	L	9	4	0 90
3-4 inch	R	7, 8, 9, 10, 12 & 14	6	0 65
3-4 inch	L	10 & 12	4	0 65
5-8 inch	R	10, 11, 12, 14 & 16	6	0 50
5-8 inch	L	10 & 12	4	0 50
9-16 inch	R	10, 12, 14 & 16	6	0 50
9-16 inch	L	12	4	0 50
1-2 inch	R	10, 12, 14, 16 & 18	6	0 40
1-2 inch	L	12 & 14	4	0 40
7-16 inch	R	10, 12, 14, 16 & 18	6	0 40
7-16 inch	L	14	6	0 40
3-8 inch	R	12, 14, 16, 18 & 20	6	0 35
5-16 inch	R	14, 16, 18, 20 & 22	6	0 30
1-4 inch	R	16, 18, 20, 22, 24, 26	6	0 30
3-16 inch	R	24, 26 & 28	6	0 30
1-8 inch	R	30 & 32	6	0 30

Taps made to order of any style and threads required. All our Taps are "Patent Relieved," to facilitate their cutting.

MACHINISTS' HAND TAPS.



Taper.

Plug.

Bottoming.

DIAMETER.	No. of Threads to inch.	PRICE EACH.	PRICE, PER SET.
¼ inch	16, 18 & 20	$0 45	$ 1 35
5-16 inch	16 & 18	0 50	1 50
⅜ inch	14, 16 & 18	0 55	1 65
7-16 inch	14 & 16	0 60	1 80
½ inch	12, 13 & 14	0 70	2 10
9-16 inch	12 & 14	0 80	2 40
⅝ inch	10, 11 & 12	0 90	2 70
11-16 inch	11 & 12	1 05	3 15
¾ inch	10, 11 & 12	1 20	3 60
13-16 inch	10	1 40	4 20
⅞ inch	9 & 10	1 60	4 80
15-16 inch	9	1 80	5 40
1 inch	8	2 00	6 00
1⅛ inch	7 & 8	2 25	6 75
1¼ inch	7	2 60	7 80
1⅜ inch	6	3 00	9 00
1½ inch	6	3 50	10 50
1⅝ inch	5 & 6	4 20	12 60
1¾ inch	5	5 00	15 00
1⅞ inch	4½ & 5	5 80	17 40
2 inch	4½	6 70	20 10

Are made Standard size unless specially ordered. Will furnish them full size, without extra charge.

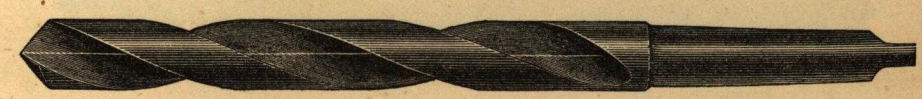
MACHINE OR NUT TAPS,

FOR MACHINES.

Diameter.	Length.	No. of Threads to the Inch.	Price, each.
¼ inch	4⅛	16, 18 & 20	$ 0 60
5-16 inch	5⅛	16 & 18	0 70
⅜ inch	5¾	14 & 16	0 80
7-16 inch	6⅜	12, 14 & 16	0 90
½ inch	7	12, 13 & 14	1 00
9-16 inch	7⅝	12 & 14	1 15
⅝ inch	8⅛	10, 11 & 12	1 30
11-16 inch	8⅞	11 & 12	1 45
¾ inch	9½	10	1 60
13-16 inch	10⅛	10	1 80
⅞ inch	11 1-16	9 & 10	2 10
15-16 inch	11 11-16	9	2 40
1 inch	12	8	2 80
1⅛ inch	12⅝	7 & 8	3 20
1¼ inch	13¼	7 & 8	3 70
1⅜ inch	13⅞	6	4 20
1½ inch	14½	6	4 70
1⅝ inch	15⅛	5 & 6	5 30
1¾ inch	15¾	5	6 00
1⅞ inch	16⅜	4½ & 5	6 80
2 inch	17	4½	7 70

PATENT INCREASE TWIST DRILLS,

WITH No. 102, MORSE, OR No. 103, AMERICAN TAPER, OR No. 104, STRAIGHT SHANKS.



Socket for American Taper.	Diameter.	Length.	Price, Each.	Socket for Morse Taper.
No. 1, $1 30.	¼	6⅛	$0 60	No. 1, $1 20.
	9-32	6¼	0 65	
	5-16	6⅜	0 70	
	11-32	6½	0 75	
	⅜	6¾	0 80	
	13-32	7	0 85	
	7-16	7¼	0 90	
	15-32	7½	0 95	
No. 2, $1.55.	½	7¾	1 00	
	17-32	8	1 10	
	9-16	8¼	1 20	
	19-32	8½	1 30	
No. 3, $2 00.	⅝	8¾	1 40	No. 2, $1 80.
	21-32	9	1 50	
	11-16	9¼	1 60	
	23-32	9½	1 70	
	¾	9¾	1 85	
	25-32	9⅞	2 00	
	13-16	10	2 15	
	27-32	10¼	2 30	
	⅞	10½	2 45	
No. 4, $2 50.	29-32	10⅝	2 60	No. 3, $2 50.
	15-16	10¾	2 75	
	31-32	10⅞	2 90	
	1	11	3 00	
	1 1-32	11⅛	3 20	
	1 1 16	11¼	3 40	
	1 3-32	11⅜	3 60	
	1 ⅛	11¾	3 80	
	1 5-32	11⅞	4 00	
	1 3-16	12	4 20	
	1 7-32	12⅛	4 40	
	1 ¼	12½	4 50	

Shanks of the Morse and American Taper Drills 1 9-32 to 2 inch diameter are the same size.	Diameter.	Length.	Price, Each.	Socket for Morse Taper.
	1 9-32	14⅛	$4 05	No. 4, $4 00.
	1 5-16	14¼	4 80	
	1 11-32	14⅜	5 00	
	1 ⅜	14½	5 20	
	1 13-32	14⅝	5 40	
	1 7-16	14¾	5 60	
	1 15-32	14⅞	5 80	
	1 ½	15	6 00	
	1 17-32	15⅛	6 30	
	1 9-16	15¼	6 60	
	1 19 32	15⅜	6 90	
	1 ⅝	15⅝	7 20	
	1 21-32	15⅝	7 50	
	1 11-16	15¾	7 80	
	1 23-32	15⅞	8 10	
	1 ¾	16	8 40	
	1 25-32	16⅛	8 60	
	1 13-16	16¼	8 80	
	1 27-32	16⅜	9 00	
	1 ⅞	16½	9 20	
	1 29-32	16⅝	9 35	
	1 15-16	16½	9 50	
	1 31-32	16½	9 65	
	2	16½	9 80	
	2 1-32	16⅛	10 20	No. 5, $7 50.
	2 1-16	17	10 60	
	2 ⅛	17	11 20	
	2 3-16	17	12 00	
	2 ¼	17½	12 80	
	2 5-16	17½	13 60	
	2 ⅜	18	14 40	
	2 7-16	18½	15 00	
	2 ½	19	15 60	

Parties ordering Taper Drills will please state whether the *Morse* or *American Taper* is desired, and if larger than 2 inches in diameter, whether to fit the No. 4 or No. 5 Socket.

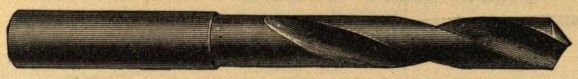
STRAIGHT SHANK DRILLS.

JOBBERS' AND MACHINISTS' SETS.

No. 105.

DIAMETER.	Length.	Price per Dozen.	Price Each.
1-16 inch	2½	$1 10	$0 09
5-64 inch	2⅝	1 10	0 10
3-32 inch	2¾	1 20	0 11
7-64 inch	2⅞	1 30	0 12
⅛ inch	3	1 45	0 13
9-64 inch	3⅛	1 60	0 15
5-32 inch	3¼	1 80	0 16
11-64 inch	3⅜	2 00	0 18
3-16 inch	3½	2 20	0 20
13-64 inch	3⅝	2 40	0 21
7-32 inch	3¾	2 65	0 23
15-64 inch	3⅞	2 90	0 26
¼ inch	4	3 15	0 28
17-64 inch	4⅛	3 40	0 30
9-32 inch	4¼	3 65	0 32
19-64 inch	4⅜	3 90	0 35
5-16 inch	4½	4 20	0 37
21-64 inch	4⅝	4 50	0 40
11-32 inch	4¾	4 80	0 42
23-64 inch	4⅞	5 10	0 45
⅜ inch	5	5 40	0 48
25-64 inch	5⅛	5 70	0 50
13-32 inch	5¼	6 00	0 53
27-64 inch	5⅜	6 40	0 55
7-16 inch	5½	6 80	0 59
29-64 inch	5⅝	7 20	0 63
15-32 inch	5¾	7 50	0 65
31-64 inch	5⅞	7 75	0 67
½ inch	6	8 00	0 70

DRILLS FITTING COE'S BLACKSMITHS' DRILL PRESS.

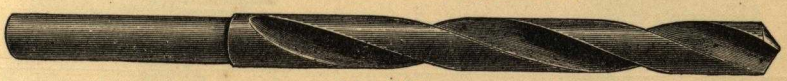


No. 110.

Diameter.	Length.	Price each.	Diameter.	Length.	Price each.
1/8	6 inches.	$0 55	5/8	6 inches.	$1 05
3-16	6 inches.	0 60	11-16	6 inches.	1 15
1/4	6 inches.	0 70	3/4	6 inches.	1 25
5-16	6 inches.	0 75	13-16	6 inches.	1 35
3/8	6 inches.	0 85	7/8	6 inches.	1 45
7-16	6 inches.	0 90	15-16	6 inches.	1 60
1/2	6 inches.	0 95	1	6 inches.	1 80
9-16	6 inches.	1 00	1 1/8	6 inches.	2 20

The above Drills have Shanks 2¼ in. long and about 41-64 inch diameter.

DRILLS FITTING THE PRENTICE OR WORCESTER BLACKSMITHS' DRILL PRESS.



No. 111.

Diameter.	Length.	Price each.	Diameter.	Length.	Price each.
1/8	5 1/8 inches.	$0 45	7-16	7 1/4 inches.	$0 90
5-32	5 3/8 inches.	0 45	15-32	7 1/8 inches.	0 95
3-16	5 5/8 inches.	0 50	1/2	7 3/4 inches.	1 00
7-32	5 7/8 inches.	0 55	17-32	8 inches.	1 10
1/4	6 1/8 inches.	0 60	9-16	8 1/4 inches.	1 20
9-32	6 1/4 inches.	0 65	19-32	8 1/2 inches.	1 30
5-16	6 3/8 inches.	0 70	5/8	8 3/4 inches.	1 40
11-32	6 1/2 inches.	0 75	21-32	9 inches.	1 50
3/8	6 3/4 inches.	0 80	11-16	9 1/4 inches.	1 60
13-32	7 inches.	0 85	3/4	9 3/4 inches.	1 85

The above Drills have shanks 2¼ inches long and ⅛ inch diameter. Diameter of shanks of Drills fitting Prentice Press No. 0, ¼ inch. Fitting Press Nos. 1 and 2, ⅛ inch. Fitting Press No. 3, 41-64 inch.

BIT STOCK DRILLS,

FOR METAL OR WOOD.

No. 109.

Diameter.	Price per doz.	Price each.	Diameter.	Price per doz.	Price each.
2-32	$1 50	$0 14	10-32	$5 40	$0 48
3-32	1 65	0 16	11-32	6 30	0 54
4-32	2 10	0 20	12-32	7 20	0 62
5-32	2 60	0 24	13-32	8 00	0 68
6-32	3 10	0 29	14-32	8 80	0 75
7-32	3 60	0 33	15-32	9 60	0 82
8-32	4 10	0 38	16-32	10 30	0 87
9-32	4 70	0 43	17-32	11 00	0 92

Price per set, 2-32 to 8-32 by 32ds. 10-32 to 12-32 by 16ths, boxed, - $2 60.

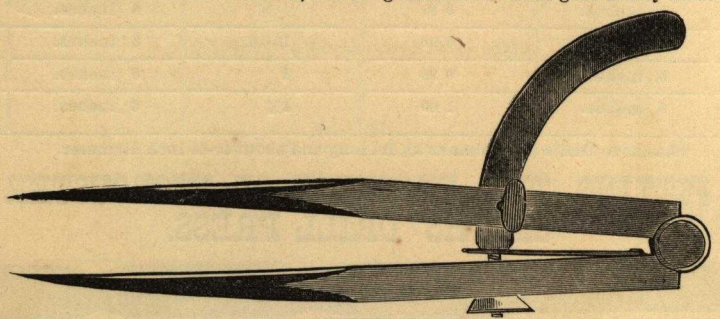
Our Bit Stock Drills will fit any brace in the market, and will drill Steel, Iron, or other Metals, as well as Wood. They are not injured by contact with screws or nails, and will bore any kind of Wood without splitting it.

BEST CAST STEEL COMPASSES.

Size, inches	3	4	5	6	7	8
Price, per dozen	$3 00	3 10	3 30	3 80	4 00	5 25

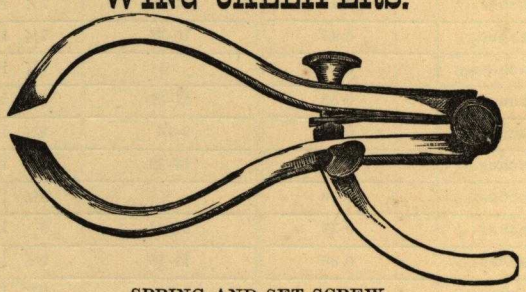
CAST STEEL COMPASS DIVIDERS.

These are made of the best material, and are guaranteed to be as good as any made



Size, inches	5	6	7	8	9	10	12	15	18	20	24
Price, per dozen	$4 25	4 25	5 00	5 75	6 85	7 60	9 15	13 75	15 25	19 00	26 60

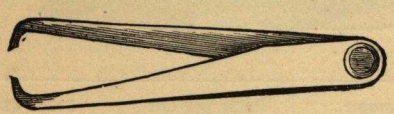
WING CALLIPERS.



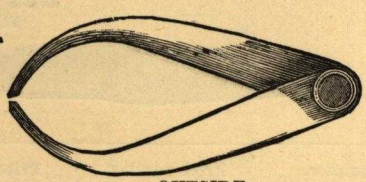
SPRING AND SET SCREW.

Size, inches	6	8	10	12	15	18	20	24
Price, per dozen	$6 60	7 60	10 65	13 40	23 00	34 40	40 00	48 00

CALLIPERS.



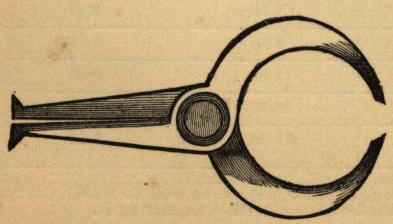
INSIDE.



OUTSIDE.

Size, inches	2½	3	4	5	6	7	8	9	10	12	14	16	18	20	24
Price, per dozen	$2 50	2 70	2 90	3 45	3 80	4 60	5 35	6 10	6 70	8 00	12 20	15 25	19 00	22 80	34 25

DOUBLE CALLIPERS.



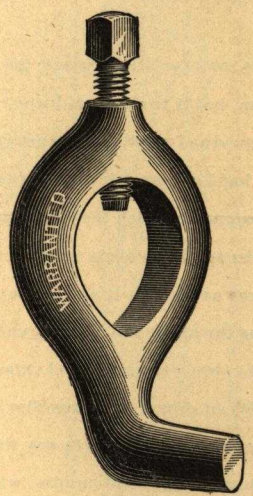
Size, inches	3	4	5	6
Price, per dozen	$3 25	3 80	4 60	6 10

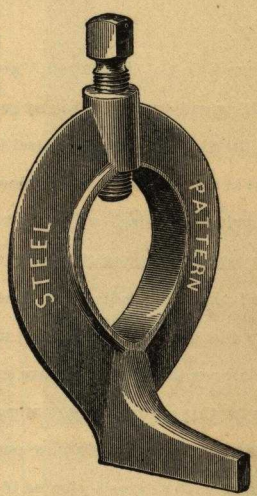
LATHE DOGS.

COMMON.

⅜ inch	$0 50
½ inch	0 60
¾ inch	0 70
1 inch	0 80
1¼ inch	0 95
1½ inch	1 10
1¾ inch	$1 25
2 inch	1 40
2½ inch	1 60
3 inch	1 80
3½ inch	2 00
4 inch	2 30

LE COUNT'S LATHE DOGS.





LE COUNT'S MALL IRON LATHE DOG.

No. 1, ⅜ inch	$0 35
No. 2, ½ inch	0 40
No. 3, ¾ inch	0 50
No. 4, 1 inch	0 60
No. 5, 1¼ inch	0 75
No. 6, 1½ inch	0 90
No. 7, 1¾ inch	1 00
No. 8, 2 inch	1 10
Small Set, $5 60.	
No. 9, 2½ inch	1 35
No. 10, 3 inch	1 50
No. 11, 3½ inch	1 70
No. 12, 4 inch	1 90
Full Set, $12 05.	

LE COUNT'S STEEL LATHE DOG.

No. 1, ⅜ inch	$0 50
No. 2, ½ inch	0 60
No. 3, ⅝ inch	0 70
No. 4, ¾ inch	0 70
No. 5, ⅞ inch	0 80
No. 6, 1 inch	0 80
No. 7, 1⅛ inch	0 95
No. 8, 1¼ inch	0 95
No. 9, 1⅜ inch	1 10
No. 10, 1½ inch	1 10
No. 11, 1¾ inch	1 25
No. 12, 2 inch	1 40
No. 13, 2¼ inch	1 60
No. 14, 2½ inch	1 60
No. 15, 3 inch	1 80
No. 16, 3½ inch	2 00
No. 17, 4 inch	2 30
No. 18, 4½ inch	3 00
No. 19, 5 inch	3 50
Full set, 19 Dogs, $26 35.	

"WESTERN FILES."

The Western File Co., "Limited," guarantees to furnish files, all kinds, and for all purposes, the most superior for both fast filing and durability to any ever made. This is a strong assertion, but it is a fact, and why? The pitch or inclination to the file, at which the chisel is held, the angles at which it is ground and whet, the free action of the chisel when the force is applied to it, all combine to make a perfect file. What the hand cutters call the "turn of the wrist," is simply allowing the chisel, when the blow is given, to freely follow the course to which the inclination at which it is set and the angles of its cutting faces draw it. That is, the chisel must be set at an angle varying from fifteen to thirty degrees from a perpendicular; if not held rigid, will change its course as soon as it enters the metal and will draw under to the bottom of the tooth, making, by its free action in entering the metal and drawing under, a sharper, smoother and deeper tooth; this, we are sure, will be apparent to any mechanic who has used a cold chisel.

It is alone for this enterprising Company to say that, with a daily capacity of over 1,000 dozen files, the largest in the world, they combine in their now perfect machinery, in which is used a Loose Chisel, not in any way fast in or to the hammer, and with as free action as if held with the hand, all the advantages of the hand-cut file, with the uniform force and accuracy of mechanical power applied to it. That is, by a patent appliance and automatic motion, the chisel is held at an exact and correct inclination for each kind of file, and when the blow is given, can freely follow the course to which the angles of its cutting faces draw it, and instantly adjusts itself as soon as the hammer is raised.

The correct inclination of the chisel is impossible for the most experienced workman by hand to always attain after each blow, and, in consequence, some of the teeth in a hand-cut file are hooking and liable to pin, and others stand back too much and will not cut.

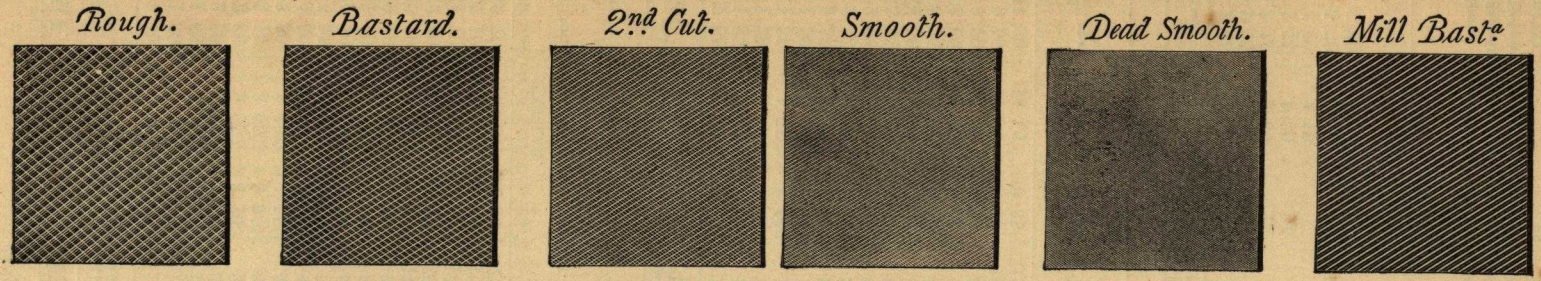
With the use of the Loose Chisel, which allows the operator to make any shaped tooth desired, we are enabled to furnish files specially adapted to different kinds of work—for machine filing, for planer knives and the hardest steel worked, for cast iron and other rough usage, and guarantee them superior to ordinary files for such work.

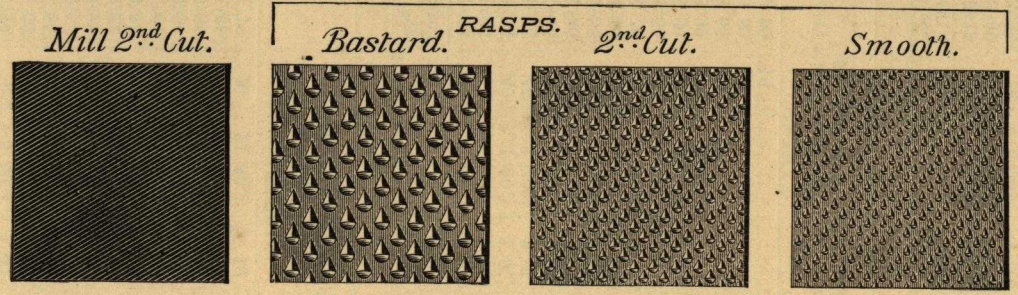
These improvements were commenced in 1879 and completed in 1880, and we say to all consumers: Try these files, made by this New and Improved Method. We fully guarantee them to cut Easier, file Smoother and do more work than the best English Files.

L. M. RUMSEY MFG. CO., WESTERN FILE CO., LIMITED,
BEAVER FALLS, PA.

For Price List, see page 344.

CUTS OF FILES AND RASPS.





GRADES OR CUTS OF LEADING REGULAR FILES.

In describing the various grades of cuts, we take as our standard a 12-inch File, using an inch section from the center of the File.
The grades are divided, as follows:
ROUGH, BASTARD, SECOND CUT, SMOOTH AND DEAD SMOOTH.

These five grades are those most in use, and are made from or by two separate cuts on the File, which forms a diamond shaped tooth. The first cut which is put on the File is known as the "over cut," and the second as the "up cut." For "Mill Saw" and "Taper Saw" Files only, the "over cut" is used to form the tooth, the tooth being a sharp ridge of metal extending at a sharp angle across the face of the File, and not intersected by any other stroke of the cutting chisel. This last tooth, as applied to Mills and Tapers, goes under the two grades of Bastard and Second Cut. The only other tooth which is in use, is that applied to Horse Rasps, Wood Rasps, Cabinet Rasps and Shoe Rasps. This tooth is raised to a conical form by the use of a punch. On Horse Rasps it is too large to designate by any grade of cut. On Wood and Cabinet Rasps it is graded under the head of Bastard, Smooth, and sometimes Second Cut. As a matter of convenience, the grade of the tooth is given by counting only one of the cuts of the File, and we take for this the "over cut" or first cut.

The Wood Rasps and Cabinet Rasps having a punched or raised tooth (each tooth being separate from the other), we give the exact number to the square inch.
Rough is formed of twenty-two teeth to the running inch.
Bastard is formed of thirty-two teeth to the running inch.
Second Cut is formed of forty-four teeth to the running inch.
Smooth Cut is formed of sixty-eight teeth to the running inch.
Dead Smooth is formed of one hundred and twenty to the running inch.
Mill Bastard is formed of a series of diagonal teeth, thirty-six to the inch.
Mill Second Cut is formed of a series of diagonal teeth, forty-four to the inch.
Taper Saw Single Cut, Second Cut is formed of a series of diagonal teeth, fifty to the inch.
Wood Rasps have a punched tooth, known as bastard grade, one hundred and five teeth to the inch.
Cabinet Rasps have a punched tooth, known as smooth, three hundred teeth to the inch.
Cabinet Rasps have a punched tooth, known as second cut, one hundred and sixty-eight teeth to the inch.

For Prices, see page 344.

WESTERN FILES.

(Adopted July 1st, 1881, by all Manufacturers.)

MILL SAW, ROUND AND SQUARE.

Inch.	Bastard.	2d Cut.	Smooth.
To 4	1 40	1 65	1 75
5	1 60	1 85	2 00
6	1 85	2 10	2 35
7	2 20	2 55	2 80
8	2 65	3 05	3 30
9	3 15	3 65	3 95
10	3 80	4 35	4 75
11	4 50	5 20	5 60
12	5 35	6 15	6 70
13	6 40	7 35	8 00
14	7 65	8 75	9 55
15	9 10	10 50	11 40
16	10 80	12 40	13 50
17	12 60	14 55	15 75
18	14 70	16 90	18 40
19	17 10	19 70	21 35
20	19 70	22 70	24 65

EXTRAS.
Mill Double Cut and Mill Pointing.
Advance 1 Inch.

MILL.

Bastard One Round Edge.
1 50
1 72
2 00
2 35
2 85
3 38
4 08
4 85
5 75
6 88
8 22
9 78
11 61
13 54
15 80
18 38
21 18

FLAT AND WARDING.

Inch.	Bastard.	2d Cut.	Smooth.
To 4	1 50	1 75	1 90
5	1 70	2 00	2 15
6	2 00	2 35	2 55
7	2 40	2 80	3 05
8	2 90	3 35	3 65
9	3 50	4 00	4 35
10	4 15	4 75	5 20
11	4 80	5 60	6 05
12	5 80	6 65	7 25
13	6 85	7 90	8 55
14	8 15	9 40	10 20
15	9 75	11 20	12 20
16	11 55	13 30	14 45
17	13 60	15 65	17 00
18	16 00	18 45	20 00
19	18 75	21 55	23 40
20	21 80	25 10	27 30

EXTRAS.
Cants (Double).
Advance 2 Inches.
Feather Edge (Double).
Advance 3 Inches.

HAND, HALF ROUND, PILLAR AND THREE SQUARE.

Inch.	Bastard.	2d Cut.	Smooth.
4	1 60	1 85	2 00
5	1 85	2 10	2 35
6	2 20	2 55	2 80
7	2 65	3 05	3 30
8	3 15	3 65	3 95
9	3 80	4 35	4 75
10	4 50	5 20	5 60
11	5 25	6 05	6 60
12	6 25	7 20	7 80
13	7 35	8 50	9 20
14	8 75	10 10	10 95
15	10 35	11 90	12 95
16	12 25	14 10	15 35
17	14 55	16 75	18 20
18	17 25	19 90	21 60
19	20 30	23 40	25 40
20	23 90	27 50	29 90

EXTRAS.
Knife and High Back Half Round.
Advance 1 Inch.
Cross and Slotting.
Advance 2 Inches.

SAW FILES.

Inch.	Taper, Single Cut.	Taper, D'be Cut to Point.	Slim Taper Single Cut.	Slim Taper Double Cut to Point.
3	1 05	1 35	1 15	1 45
3½	1 05	1 35	1 15	1 45
4	1 20	1 50	1 25	1 55
4½	1 35	1 75	1 40	1 75
5	1 60	2 00	1 55	1 95
5½	1 85	2 35	1 75	2 20
6	2 15	2 75	2 05	2 55
7	2 75	3 45	2 45	3 10
8	3 45	4 30	3 00	3 75
9	4 30	5 40	3 65	4 55
10	5 35	6 70	4 50	5 60
11	6 60	8 25	5 55	6 90
12	8 00	10 00	6 85	8 55
13	9 55	11 95	8 40	10 50
14	11 30	14 15	10 35	12 90

EXTRAS.
Taper Single Cut to Point.
Advance 1 Inch.

Inch.	Pit Saw Blunt Single Cut.	Band Saw Taper Single Cut.	Gin Saw Taper Single Cut.
3	1 50	1 70	1 60
3½	1 50	1 70	1 60
4	1 60	1 85	1 75
4½	1 70	2 05	1 95
5	1 85	2 35	2 10
5½	2 10	2 65	2 30
6	2 45	3 00	2 45
7	3 15	3 70	2 80
8	3 95	4 50	3 15
9	4 80		
10	5 80		
11	6 85		
12	8 00		
13			
14			

EXTRAS.
Round Gulleting takes Pit-Saw Price.

WOOD FILES AND RASPS.

Inch.	Cabinet File and Rasp.	Half Round Wood Rasp.	Flat Wood Rasp.
6	2 90	2 55	2 35
7	3 50	3 05	2 80
8	4 20	3 65	3 35
9	5 00	4 35	4 00
10	6 00	5 20	4 75
11	7 00	6 05	5 60
12	8 25	7 20	6 65
13	9 65	8 50	7 90
14	11 30	10 10	9 40
15	13 15	11 90	11 20
16	15 40	14 10	13 30

EXTRAS.
Half Round Wood Files.
Take 1-2 Round Bastard Price.
Flat Wood Files.
Take Flat Bastard Price.

SHOE RASPS.

Inch.	Half Round Rasps.	Flat Rasps.	Last Mkr's Rasp.	Oval Shoe Rasp.
6	2 45	2 00		3 15
7	2 65	2 40		3 40
8	3 10	2 90		3 95
9	3 75	3 50		4 75
10	4 60	4 10		5 80
11	5 70	4 85		7 10
12	7 00	5 80	9 00	8 70
13			10 50	
14			12 10	

HORSE RASPS.

Inch.	Plain Rasps.	Beveled Rasps.	Tang'd Rasps
10	4 65	5 35	6 30
11	5 35	6 30	7 55
12	6 30	7 55	9 00
13	7 55	9 00	10 80
14	9 00	10 80	12 80
15	10 80	12 80	15 00
16	12 80	15 00	17 60
17	15 00	17 60	
18	17 60		

Hook Tooth Blunt Single Cut.

6	Inch.	2 65
7	"	3 15
8	"	3 80
9	"	4 50
10	"	5 25
11	"	6 15
12	"	7 10

Round Off.
Takes Hook Tooth Price.

EXTRAS (GENERAL).

One Round Edge, advances 7½ per cent., and two round edges 15 per cent. on respective Kinds and Cuts.

Dead Smooth double the price of Bastard Cut, Equalings (Bellied), advanced 2 inches on respective Kinds and Cuts.

Size, Below 4 inches, not extended, take price of 4 inch; ½ inches not specified take next higher full inch price.

All lengths above those listed, and Files varying from standard sizes, shall be classed as Irregular goods, and be subject to special prices.

Rough, coarse, or other than regular cuts (except those herein provided for), which are made upon Standard, Shaped Blanks, and also Blunt Files, advances one inch on respective kinds and Cuts.

ARCADE FILES.

(Adopted July 1st, 1881, by all Manufacturers.)

MILL SAW, ROUND AND SQUARE.				MILL.	FLAT AND WARDING.				HAND, HALF ROUND, PILLAR AND THREE SQUARE.			
Inch.	Bastard.	2d Cut.	Smooth.	Bastard One Round Edge.	Inch.	Bastard.	2d Cut.	Smooth.	Inch.	Bastard.	2d Cut.	Smooth.
To 4	1 40	1 65	1 75	1 50	To 4	1 50	1 75	1 90	4	1 60	1 85	2 00
5	1 60	1 85	2 00	1 72	5	1 70	2 00	2 15	5	1 85	2 10	2 35
6	1 85	2 10	2 35	2 00	6	2 00	2 35	2 55	6	2 20	2 55	2 80
7	2 20	2 55	2 80	2 35	7	2 40	2 80	3 05	7	2 65	3 05	3 30
8	2 65	3 05	3 30	2 85	8	2 90	3 35	3 65	8	3 15	3 65	3 95
9	3 15	3 65	3 95	3 38	9	3 50	4 00	4 35	9	3 80	4 35	4 75
10	3 80	4 35	4 75	4 08	10	4 15	4 75	5 20	10	4 50	5 20	5 60
11	4 50	5 20	5 60	4 85	11	4 80	5 60	6 05	11	5 25	6 05	6 60
12	5 35	6 15	6 70	5 75	12	5 80	6 65	7 25	12	6 25	7 20	7 80
13	6 40	7 35	8 00	6 88	13	6 85	7 90	8 55	13	7 35	8 50	9 20
14	7 65	8 75	9 55	8 22	14	8 15	9 40	10 20	14	8 75	10 10	10 95
15	9 10	10 50	11 40	9 78	15	9 75	11 20	12 20	15	10 35	11 90	12 95
16	10 80	12 40	13 50	11 61	16	11 55	13 30	14 45	16	12 25	14 10	15 35
17	12 60	14 55	15 75	13 54	17	13 60	15 65	17 00	17	14 55	16 75	18 20
18	14 70	16 90	18 40	15 80	18	16 00	18 45	20 00	18	17 25	19 90	21 60
19	17 10	19 70	21 35	18 38	19	18 75	21 55	23 40	19	20 30	23 40	25 40
20	19 70	22 70	24 65	21 18	20	21 80	25 10	27 30	20	23 90	27 50	29 90

EXTRAS.
Mill Double Cut and Mill Pointing.
Advance 1 Inch.

EXTRAS.
Cants (Double).
Advance 2 Inches.
Feather Edge (Double).
Advance 3 Inches.

EXTRAS.
Knife and High Back Half Round.
Advance 1 Inch.
Cross and Slotting.
Advance 2 Inches.

SAW FILES.

Inch.	Taper, Single Cut.	Taper, D'be Cut to Point.	Slim Taper Single Cut.	Slim Taper Double Cut to Point.
3	1 05	1 35	1 15	1 45
3½	1 05	1 35	1 15	1 45
4	1 20	1 50	1 25	1 55
4½	1 35	1 75	1 40	1 75
5	1 60	2 00	1 55	1 95
5½	1 85	2 35	1 75	2 20
6	2 15	2 75	2 05	2 55
7	2 75	3 45	2 45	3 10
8	3 45	4 30	3 00	3 75
9	4 30	5 40	3 65	4 55
10	5 35	6 70	4 50	5 60
11	6 60	8 25	5 55	6 90
12	8 00	10 00	6 85	8 55
13	9 55	11 95	8 40	10 50
14	11 30	14 15	10 35	12 90

EXTRAS.
Taper Single Cut to Point.
Advance 1 Inch.

Inch.	Pit Saw Blunt Single Cut.	Band Saw Taper Single Cut.	Gin Saw Taper Single Cut.
3	1 50	1 70	1 60
3½	1 50	1 70	1 60
4	1 60	1 85	1 75
4½	1 70	2 05	1 95
5	1 85	2 35	2 10
5½	2 10	2 65	2 30
6	2 45	3 00	2 45
7	3 15	3 70	2 80
8	3 95	4 50	3 15
9	4 80		
10	5 80		
11	6 85		
12	8 00		
13			
14			

EXTRAS.
Round Gulleting takes Pit-Saw Price.

WOOD FILES AND RASPS.

Inch.	Cabinet File and Rasp.	Half Round Wood Rasp.	Flat Wood Rasp.
6	2 90	2 55	2 35
7	3 50	3 05	2 80
8	4 20	3 65	3 35
9	5 00	4 35	4 00
10	6 00	5 20	4 75
11	7 00	6 05	5 60
12	8 25	7 20	6 65
13	9 65	8 50	7 90
14	11 30	10 10	9 40
15	13 15	11 90	11 20
16	15 40	14 10	13 30

EXTRAS.
Half Round Wood Files.
Take 1-2 Round Bastard Price.
Flat Wood Files.
Take Flat Bastard Price.

SHOE RASPS.

Inch.	Half Round Rasps.	Flat Rasps.	Last Mkr's Rasp.	Oval Shoe Rasp.
6	2 45	2 00		3 15
7	2 65	2 40		3 40
8	3 10	2 90		3 95
9	3 75	3 50		4 75
10	4 60	4 10		5 80
11	5 70	4 85		7 10
12	7 00	5 80	9 00	8 70
13			10 50	
14			12 10	

HORSE RASPS.

Inch.	Plain Rasps.	Beveled Rasps.	Tang'd Rasps
10	4 65	5 35	6 30
11	5 35	6 30	7 55
12	6 30	7 55	9 00
13	7 55	9 00	10 80
14	9 00	10 80	12 80
15	10 80	12 80	15 00
16	12 80	15 00	17 60
17	15 00	17 60	
18	17 60		

Hook Tooth Blunt Single Cut.

6	Inch.	2 65
7	"	3 15
8	"	3 80
9	"	4 50
10	"	5 25
11	"	6 15
12	"	7 10

Round Off.
Takes Hook Tooth Price.

GUARANTEED EQUAL TO ANY ENGLISH CUT FILES.

EXTRAS (GENERAL).

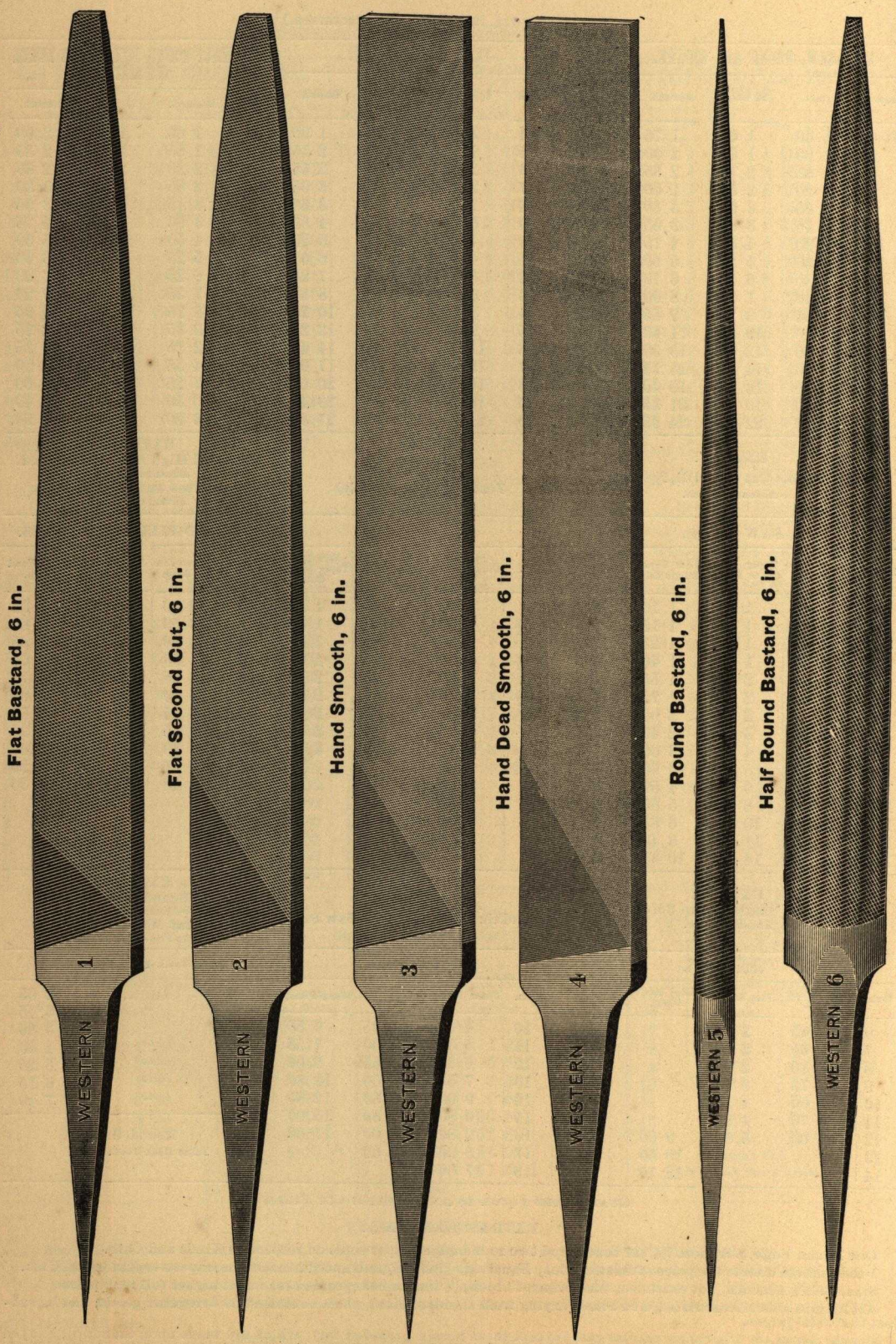
One Round Edge, advances 7½ per cent., and two round edges 15 per cent. on respective Kinds and Cuts.

Dead Smooth double the price of Bastard Cut, Equalings (Bellied), advanced 2 inches on respective Kinds and Cuts.

Size, Below 4 inches, not extended, take price of 4 inch; ½ inches not specified take next higher full inch price.

All lengths above those listed, and Files varying from standard sizes, shall be classed as Irregular goods, and be subject to special prices.

Rough, coarse, or other than regular cuts (except those herein provided for), which are made upon Standard, Shaped Blanks, and also Blunt Files, advances one inch on respective kinds and Cuts.


Flat Bastard, 6 in.
WESTERN 1
Flat Second Cut, 6 in.
WESTERN 2
Hand Smooth, 6 in.
WESTERN 3
Hand Dead Smooth, 6 in.
WESTERN 4
Round Bastard, 6 in.
WESTERN 5
Half Round Bastard, 6 in.
WESTERN 6

Warding Bastard, 6 in.

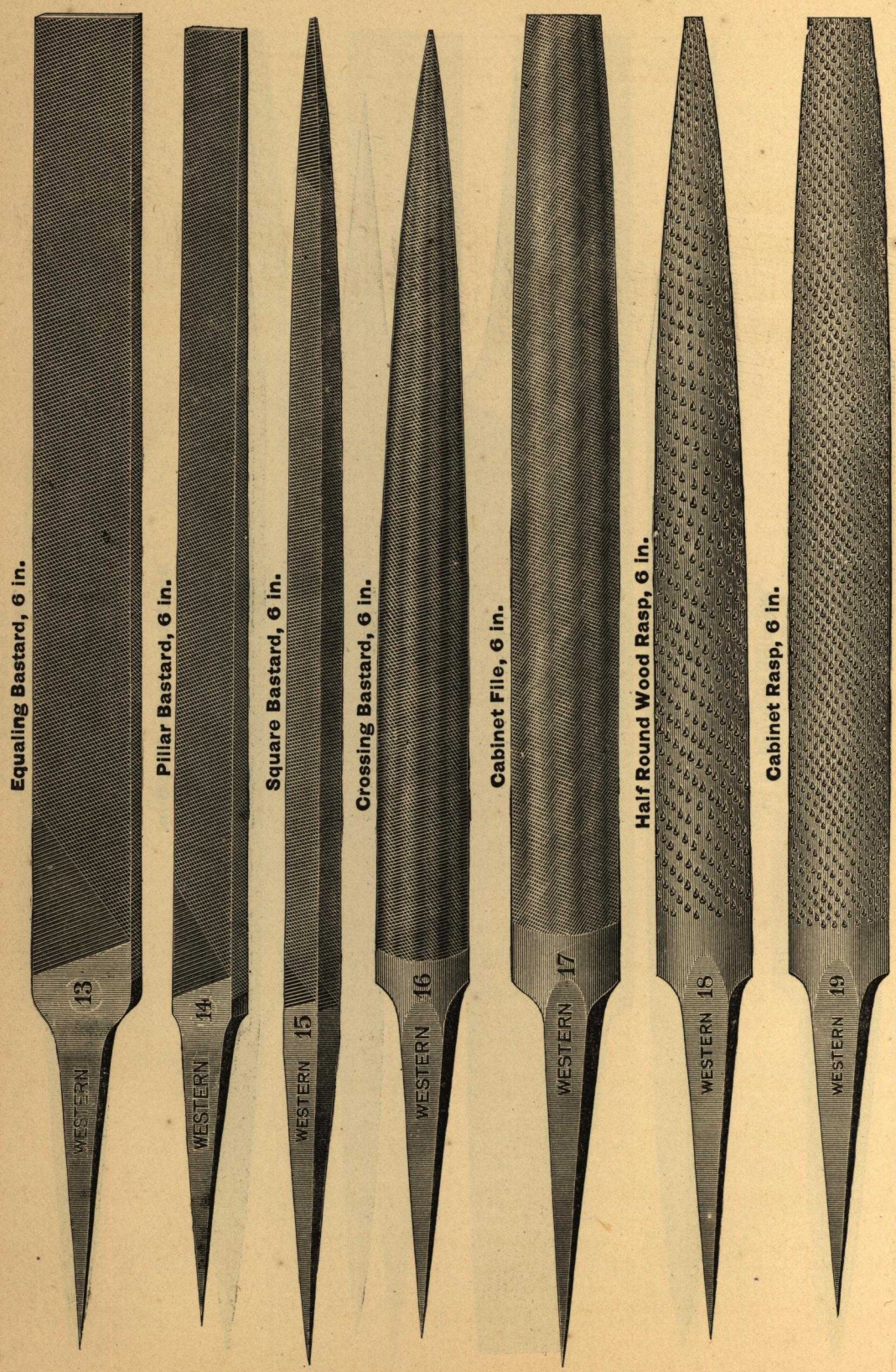
3 Square Bastard, 6 in.

Mill Bastard, 6 in.

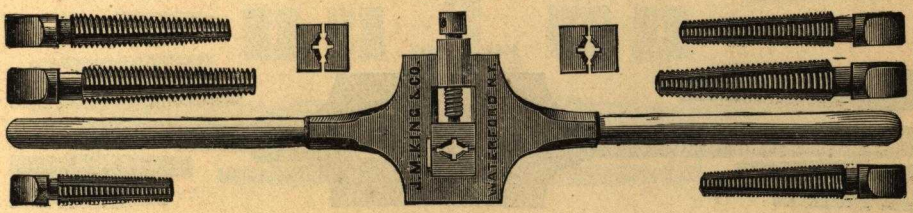
Slim Taper Saw File, 6 in.

Band Saw Taper File, 6 in.

Taper Saw File, 6 in.

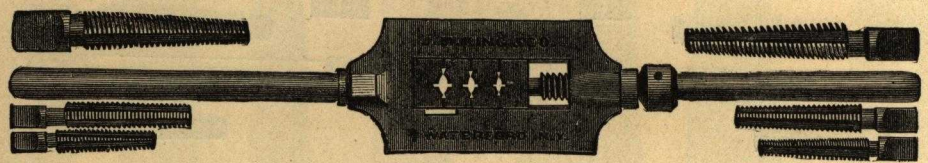

Equaling Bastard, 6 in.
WESTERN 13
Pillar Bastard, 6 in.
WESTERN 14
Square Bastard, 6 in.
WESTERN 15
Crossing Bastard, 6 in.
WESTERN 16
Cabinet File, 6 in.
WESTERN 17
Half Round Wood Rasp, 6 in.
WESTERN 18
Cabinet Rasp, 6 in.
WESTERN 19

BLACKSMITHS' STOCKS AND DIES.



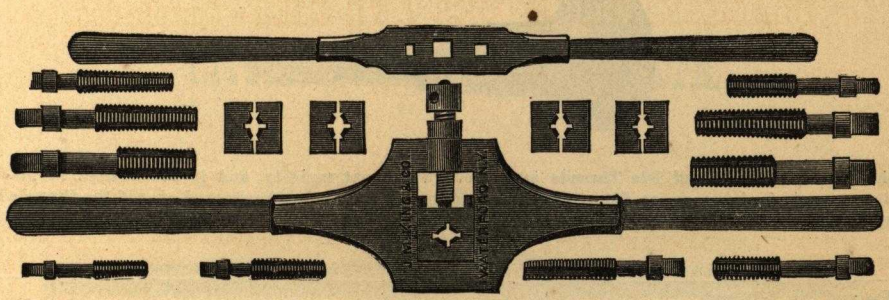
Number 1.	Cuts 2 inches to 1 inch Right Hand, 4½ and 7 Threads to the inch..... " 2 " 1 " Left " 4½ and 7 " " ..... 8 Taps and 4 Pair of Dies.	$60 00
Number 2.	Cuts 2 inches to ⅞ inch Right Hand, 4½, 6, 7 and 8 Threads to the inch..... 8 Taps and 4 Pair of Dies.	60 00
Number 3.	Cuts 1¾ inches to ⅞ inch Right Hand, 6 and 8 Threads to the inch..... " 1¾ " ⅞ " Left " 6 and 8 " " ..... 8 Taps and 4 Pair of Dies.	45 00
Number 4.	Cuts 1¾ inches to ¾ inch Right Hand, 6, 7, 8 and 9 Threads to the inch..... 8 Taps and 4 Pairs of Dies.	45 00
Number 5.	Cuts 1½ inches to ¾ inch Right Hand, 8 and 9 Threads to the inch..... " 1½ " ¾ " Left " 8 and 9 " " ..... 8 Taps and 4 Pair of Dies.	35 00
Number 5½.	Cuts 1½ inches to ¾ inch Right Hand, 6, 7, 8 & 9 Threads to the inch..... 8 Taps and 4 Pair of Dies.	35 00
Number 7.	Cuts 1¼ inches to ⅝ inches Right Hand, 8 and 10 Threads to the inch..... " 1¼ " ⅝ " Left " 8 " " ..... 6 Taps and 3 Pair of Dies.	12 00
Number 9.	Cuts 1¼ inches to ½ inch Right Hand, 8, 10 and 12 Threads to the inch..... 6 Taps and 3 Pair of Dies.	12 00
Number 17.	Cuts 1 inch to ½ inch Right Hand, 9 and 12 Threads to the inch..... " 1 " ¾ " Left " 9 " " ..... 6 Taps and 3 Pair of Dies.	9 00
Number 19.	Cuts 1 inch to ⅜ inch Right Hand, 9, 12, and 14 Threads to the inch ..... 6 Taps and 3 Pair of Dies.	9 00
Number 25.	Cuts ¾ inch to ⅜ inch Right Hand, 10 and 12 Threads to the inch..... " ¾ " ½ " Left " 10 " " ..... 6 Taps and 3 Pair of Dies.	6 50
Number 27.	Cuts ¾ inch to ⅜ inch Right Hand, 10, 12 and 16 Threads to the inch..... 6 Taps and 3 Pair of Dies.	6 50
Number 45.	Cuts ⅝ inch to 5-16 inch Right Hand, 12 and 16 Threads to the inch..... " ⅝ " 7-16 " Left " 12 " " ..... 6 Taps and 3 Pair of Dies.	5 50
Number 47.	Cuts ⅝ inch to ¼ inch Right Hand, 12, 14 and 18 Threads to the inch..... 6 Taps and 3 Pair of Dies.	5 50
Number 49.	Cuts ½ inch to ¼ inch Right Hand, 14 and 18 Threads to the inch..... " ½ " 5-16 " Left " 14 " " ..... 6 Taps and 3 Pair of Dies.	4 50
Number 51.	Cuts ½ inch to 3-16 inch Right Hand, 14, 18 and 22 Threads to the inch..... 6 Taps and 3 Pair of Dies.	4 50

BLACKSMITHS' STOCKS AND DIES—Continued.



Number 6.	Cuts 1½ inches to 1 inch Right Hand, 8 Threads to the inch " 1½ " 1 " Left " 8 " " 4 Taps and 2 Sets of Dies.	$20 00
Number 11.	Cuts 1¼ inches to ⅝ inch Right Hand, 8 and 10 Threads to the inch " 1¼ " ⅝ " Left " 8 " " 4 Taps and 3 Sets of Dies.	10 00
Number 15.	Cuts 1¼ inches to ½ inch Right Hand, 8, 10 and 12 Threads to the inch 5 Taps and 3 Sets of Dies.	10 00
Number 21.	Cuts 1 inch to ½ inch Right Hand, 9 and 12 Threads to the inch " 1 " ¾ " Left " 9 " " 4 Taps and 3 Sets of Dies.	6 00
Number 23.	Cuts 1 inch to ⅜ inch Right Hand, 9, 10 and 14 Threads to the inch ° Taps and 3 Sets of Dies.	5 00
Number 32.	Cuts ¾ inch to ⅜ inch Right Hand, 10 and 14 Threads to the inch " ¾ " ⅜ " Left " 10 " 14 " " 4 Taps and 4 Sets of Dies.	5 00
Number 33.	Cuts ¾ inch to ½ inch Right Hand, 10 Threads to the inch " ¾ " ½ " Left " 10 " " 2 Taps and 2 Sets of Dies.	4 00
Number 34.	Cuts ¾ inch to 5-16 inch Right Hand, 10, 12 and 16 Threads to the inch 3 Taps and 3 Sets of Dies.	4 50
Number 35.	Cuts ¾ inch to ⅜ inch Right Hand, 10 and 14 Threads to the inch 2 Taps and 2 Sets of Dies.	4 00
Number 37.	Cuts ⅝ inch to 3-16 inch Right Hand, 14, 18 and 22 Threads to the inch 6 Taps and 3 Sets of Dies.	4 25
Number 38.	Cuts ⅝ inch to 5-16 inch Right Hand, 12 and 18 Threads to the inch " ⅝ " 7-16 " Left " 12 " " 6 Taps and 3 Sets of Dies.	4 50
Number 41.	Cuts ½ inch to ⅛ inch Right Hand, 16, 20 and 26 Threads to the inch 6 Taps and 3 Sets of Dies.	3 25
Number 42.	Cuts ½ inch to 3-16 inch Right Hand, 14 and 20 Threads to the inch " ½ " 5-16 " Left " 14 " " 6 Taps and 3 Sets of Dies.	3 50
Number 53.	Cuts 5-16 to 1-16 inch Right Hand, 16, 20, 24 and 32 Threads to the inch 4 Taps and 4 Sets of Dies.	2 75

MACHINISTS' STOCKS AND DIES.



K. No. 1.

CUTS 2 IN. TO 1⅛ IN., INCLUSIVE, RIGHT HAND.

Size, inches, Plug and Taper Taps	2	1¾	1½	1⅜	1¼	1⅛	$ 90 00
No. Threads to the inch	4½	5	6	6	7	7 or 8	

12 Taps, 6 Pair of Dies and 2 Tap Wrenches.

K. No. 2.

CUTS 1⅛ IN. TO ⅞ IN., INCLUSIVE, RIGHT HAND.

Size, inches, Plug and Taper Taps	1⅛	1⅛	1¼	1⅛	1	⅞	$40 00
No. Threads to the inch	6	6	7	7 or 8	8	9	

12 Taps, 6 Pair Dies and Wrench.

K. No. 3.

CUTS 1¼ IN. TO ¾ IN., INCLUSIVE, RIGHT HAND.

Size, inches, Plug and Taper Taps	1¼	1⅛	1	⅞	¾	$ 30 00
No. Threads to the inch	7	7 or 8	8	9	10	

10 Taps, 5 Pair of Dies and Wrench.

K. No. 4.

CUTS 1 IN. TO ⅛ IN., INCLUSIVE, RIGHT HAND.

Size, inches, Plug and Taper Taps	1	⅞	¾	⅝	½	$ 20 00
No. Threads to the inch	8	9	10	11	12 or 13	

10 Taps, 5 Pair of Dies and Wrench.

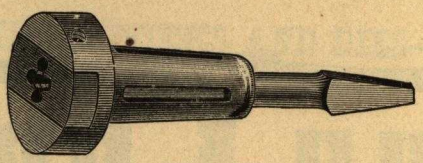
K. No. 5.

CUTS ¾ IN. TO ¼ IN., INCLUSIVE, RIGHT HAND.

Size, inches, Plug and Taper Taps	¾	⅝	½	⅜	¼	$ 15 00
No. Threads to the inch	10	11	12 or 13	16	20	

10 Taps, 5 Pair of Dies and Tap Wrench.

BIT BRACE COLLET AND DIE.



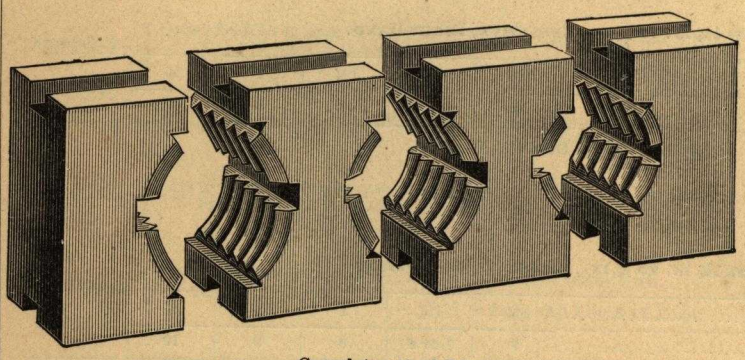
With the Bit Brace Collet and Die Threads can be cut with great rapidity, and it can be used in places where a Screw Plate cannot; for instance, on Clips, after they are shaped. Bolts can be dressed over if the threads have been bruised, without removing from place, etc.

PRICES.

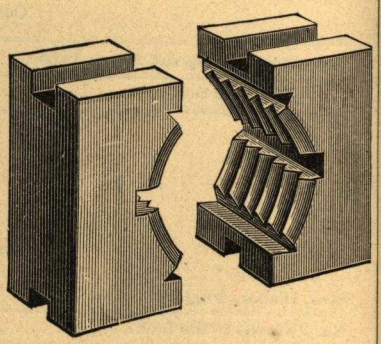
1 Collet, Tap and Die, 3-16 inch	$1 90
1 Collet, Tap and Die, ¼ inch	1 90
1 Collet, Tap and Die, 5-16 inch	1 95
1 Collet, Tap and Die, ⅜ inch	2 00
1 Collet, Tap and Die, 7-16 inch	2 60
1 Collet, Tap and Die, ½ inch	2 70

BLACKSMITHS' DIES,

FURNISHED EXTRA.



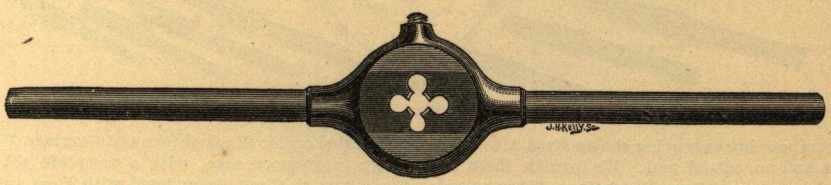
Complete set of Dies.



Pair of Dies.

For No. 1 or 2 Stock	$12 00
For No. 3 or 4 Stock	10 00
For No. 5 or 5½ Stock	8 00
For No. 6 Stock	6 00
For No. 7 or 9 Stock	3 50
For No. 11 or 15 Stock	3 00
For No. 17 or 19 Stock	2 50
For No. 21 or 23 Stock	2 00
For No. 25, 27 or 32 Stock	2 25
For No. 33 Stock	1 50
For No. 34 Stock	2 00
For No. 35, 37, 38, 41 or 42 Stock	1 50
For No. 45 or 47 Stock	2 25
For No. 49 or 51 Stock	2 00
For No. 53 Stock	1 50

LITTLE GIANT SCREW PLATE.



[Patented January 29, 1878.]

Dies adjustable for wear. Perfect Threads at one cut. Dies made from the best English Flat Steel, and best materials are used for every part.

Threads are cut and not bruised, and therefore are not raised above the size of the iron. Any part can be duplicated.

PRICES OF PLATES, WITH COLLETS, TAPS AND DIES.

Size A, cuts ¼, 5-16, ⅜, 7-16 and ½ inch	$12 00
Size B, cuts ⅝, ¾, ⅞ and 1 inch	18 00
Size C, cuts ¼, 5-16, ⅜, 7-16, ½, ⅝ and ¾ inch	20 00
Size D, cuts ⅜, 7-16, ½, ⅝, ¾, ⅞ and 1 inch	26 25
Extra Collets, Size A	0 40
Extra Collets, Size B, C and D	0 50
Extra Handle, Size A	1 25
Extra Handle, Size B, C and D	1 50

For Size C, we usually furnish a small plate for all sizes to one-half inch, and a large plate for the larger sizes, thus giving two plates (in a case) without extra charge.

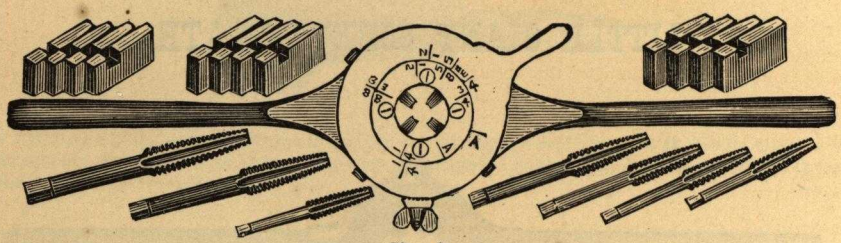
Unless otherwise ordered, we fit our Taps and Dies for rough iron.

This is unquestionably the best Screw Plate in the market, and the reason why we are able to make superior goods, for a reasonable price, because our expenses are small in proportion to amount of goods made, and our machinery well adapted for the purpose.

Nuts and Bolts need not be matched. Nuts can be made to fit tightly or loosely.

We furnish with each Plate a nice Case, which keeps each Die and Tap in its place.

MAGIC SCREW PLATE.



Size A.

The accompanying engraving shows sizes A and B Magic as fitted up for Blacksmiths and Carriage Makers, having fixed handles and no cut-off tool. We furnish them put up in a neat wood case, with a complete set of Taps and Dies for tapping nuts and threading bolts. When so ordered, we furnish these plates fitted with Taps and Dies having standard threads, particularly adapted for use by the Machinist and Model Maker. Each set of Dies will thread bolts ¼ inch larger or 1-16 inch smaller than indicated in list and marked on the Dies. The Taps are 1-64 over size up to 7-16; larger sizes, 1-32.

FOR BLACKSMITHS AND CARRIAGE MAKERS.

SIZE A CUTS.

Diameter	¼ & 5-16	⅜ & 7-16	½ & 9-16	⅝ & ¾	
Threads	18	14	12	10	$17 00

Put up in case with 8 Taps and 4 sets of Dies.

SIZE B CUTS.

Diameter	¼ & 5-16	⅜ & 7-16	½ & 9-16	⅝ & ¾	⅞ & 1	
Threads	18	14	12	10	8	$24 00

Put up in case with 10 Taps and 5 sets of Dies.

No. 2 CUTS.

Diameter	½ & 9-16	⅝ & ¾	⅞ & 1	1⅛ & 1¼	1⅜ & 1½	
Threads	12	10	8	7	6	$44 00

Put up in case with 10 Taps and 5 sets of Dies.

No. 3 PLATE is furnished to cut Bolts up to 2 inches.

FOR MACHINISTS AND MODEL MAKERS.

SIZE A CUTS.

Diameter	¼	5-16	⅜	7-16	½ & 9-16	⅝	¾	
Threads	20	18	16	14	12	11	10	$20 00

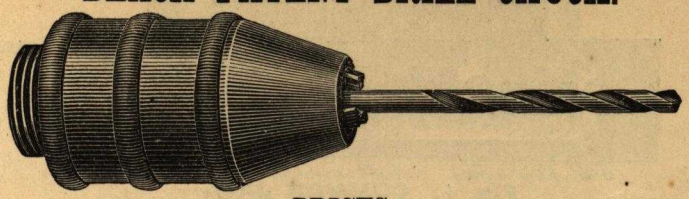
Put up in case with 8 Taps and 7 sets of Dies.

SIZE B CUTS.

Diameter	¼	5-16	⅜	7-16	½ & 9-16	⅝	¾	⅞	1	
Threads	20	18	16	14	12	11	10	9	8	$30 00

Put up in case with 10 Taps and 9 sets of Dies.

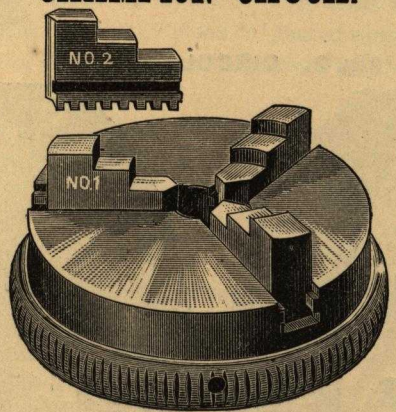
BEACH PATENT DRILL CHUCK.



PRICES.

No. 0, holding from 0 to ⅛ inch diameter (for jewelers)	$ 8 00
No. 1, holding from 0 to ¼ inch diameter	8 00
No. 3, holding from 1-16 to ½ inch diameter	10 00
No. 4, holding from 3-16 to ⅝ inch diameter	11 00

CHAMPION CHUCK.



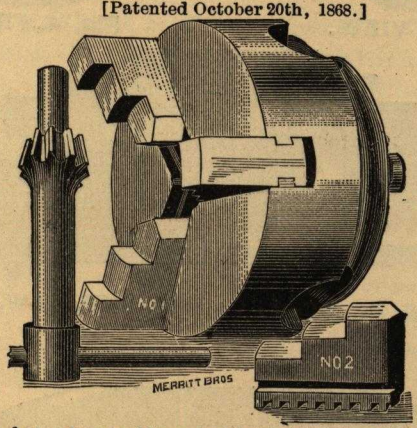
This tasty little Chuck is specially designed for Foot and light Power Lathes, and is operated by hand or lever. It is light, yet very strong and durable, the shell being made of malleable iron, and the scroll of steel. The jaws are also of steel, with steps in the usual form, either No. 1, No. 2, or both as wanted. The Chuck is attached to the Lathe by means of a face plate, or a taper plug, as desired. Is furnished with screws to fasten the plate, and a lever to operate it with. This is a very desirable Chuck for amateurs and light work generally.

2 inch	$4 50
2½ inch	5 00
3 inch	5 50

Extra Sets Jaws, $1 25.

IMPROVED GEARED CHUCK.

[Patented October 20th, 1868.]



This Chuck has been in the market so long and become so well known, that a detailed description is unnecessary. It is neat in appearance, strong and serviceable, and for work that requires changing often, is not excellent. There being three openings for the wrench, one of them will be up to receive it when the lathe stops, thereby saving time on quick work. Wrench and Face Plate Screws included.

3 inch Diameter	$10 00	6 inch Diameter	$17 00
4½ inch Diameter	13 00	9 inch Diameter	22 00

Add 20 per cent. for Two Sets of Jaws.

THE SWEETLAND CHUCK.

THIS CHUCK IS

Universal,
Eccentric,
Independent,
Comprehensive.

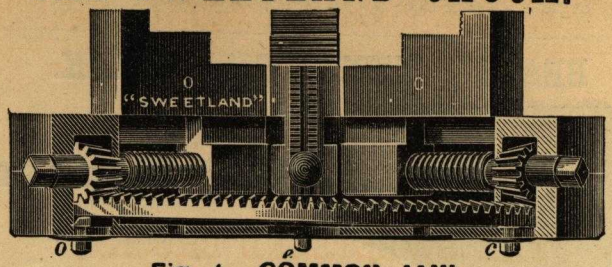


Fig. 1. COMMON JAW.

UNEXCELLED FOR

Strength,
Accuracy,
Durability,
Simplicity.

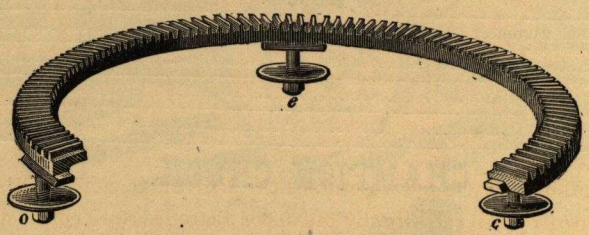


Fig. 2. CIRCULAR RACK.

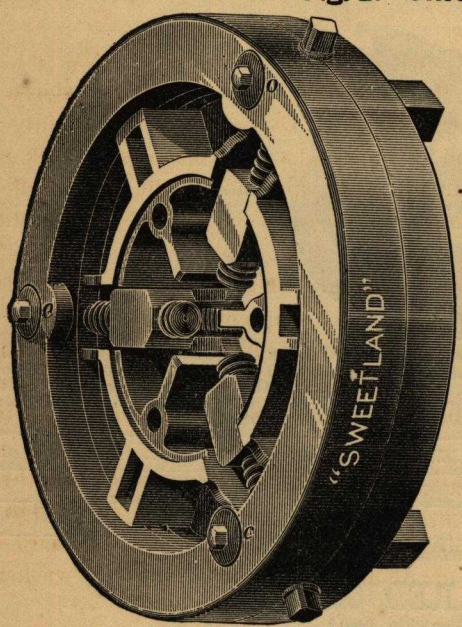


Fig. 3. BACK VIEW.

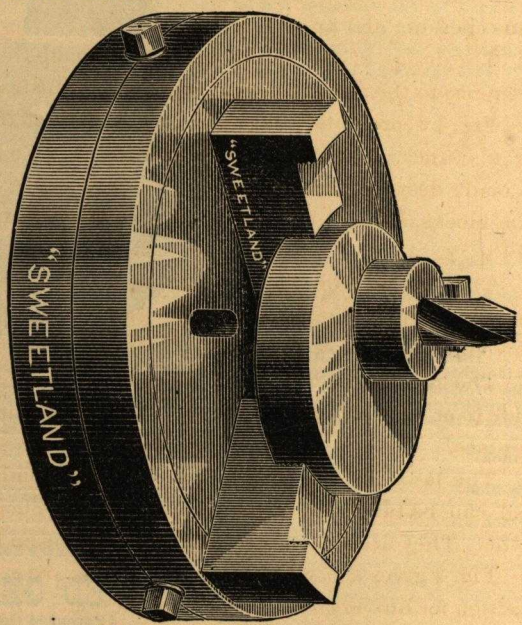


Fig. 4. FRONT VIEW.

PRICE LIST.

THREE JAWS.

Diameter.	Price.
4 inch,	$22.00
6 "	26.00
9 "	34.00
12 "	44.00
15 "	52.00
18 "	62.00
21 "	80.00
24 "	100.00
30 "	170.00
36 "	220.00
Car Wheels,	250.00

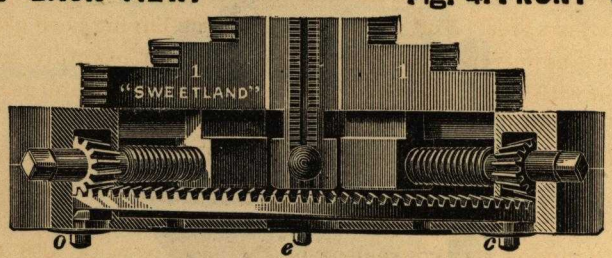


Fig. 5. No. 1, Or REVERSE JAW.

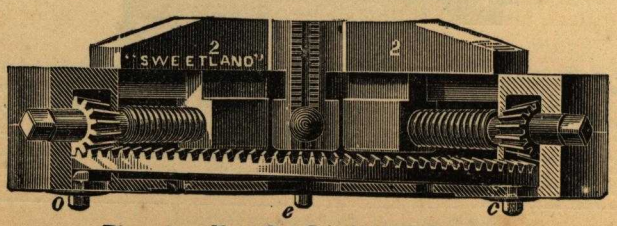


Fig. 6. No. 2, Or INSIDE JAW.

PRICE LIST.

FOUR JAWS.

Diameter.	Price.
6 inch,	$32.00
9 "	42.00
12 "	56.00
15 "	64.00
18 "	75.00
21 "	95.00
24 "	120.00
30 "	200.00

THE SWEETLAND CHUCK.

[Patented February 4th, 1879.]

In general construction this Chuck resembles the Universal Screw Chuck, the jaws being moved to and from the centre, universally, by means of geared screws connected with the circular rack which revolves in a recess in the back plate. The front and back plates are bolted together, thus encasing and protecting the gearing.

The design of the improvement is to make the Chuck independent as well as universal, and reference to the accompanying engravings illustrate the means employed to attain this object.

Fig. 1 represents the entire mechanism of the SWEETLAND CHUCK, showing plainly the circular rack and pinion screws, connected at *o* and disconnected at *c*. The recess in back plate is made deep enough to disconnect the gearing. In the recess, and underneath the rack, lie the cam blocks, beveled to correspond with the continuous bevel recess in the back of rack, as shown in Fig. 2.

These bevel cam blocks have radial motion, and when moved to the outer portion of the recess and rack they connect the gearing, making the Chuck universal; and when they are moved inward, allow the rack to disengage from the pinion, thus making each screw independent.

The cam blocks are held in place by the convex spring washers, *o*, *e*, *c*, which allow them to slide to or from the centre without disturbing the nuts, the friction being sufficient to hold them in place.

The jaws have a long bite on the inner end, are strong in the nut which has a full thread, and can be taken out of the Chuck, for the purpose of cleaning, without removing it from the lathe. They are ground perfectly true on face and bite, also outer end, after being case-hardened.

Fig. 3 gives a back view of all Chucks over 9 in. diameter, showing the spring washer in position for universal or independent action.

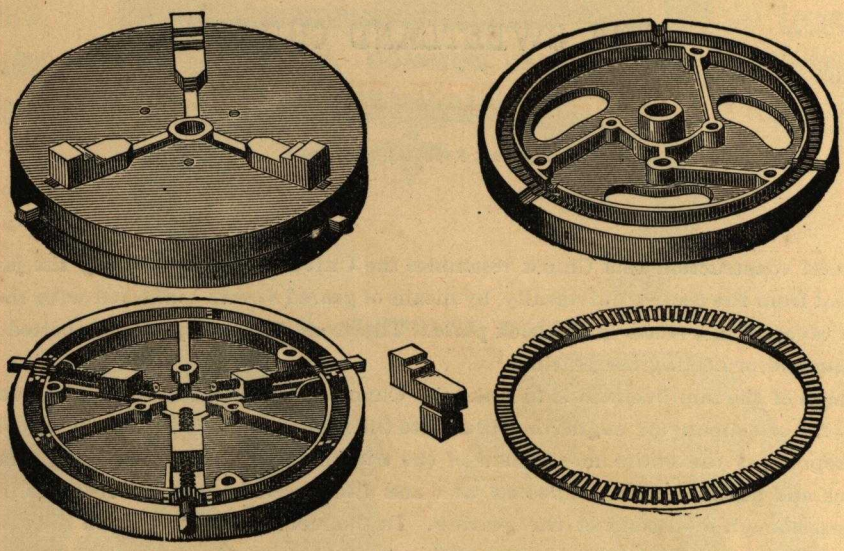
Fig. 4 gives a front view of the Chuck holding an eccentric. The line on face is designed as a guide for setting the jaws true. For instance, the Chuck having been used independent, the operator wishing to use it as universal, the jaws would be moved inwardly, so that the outer end would be perfectly even with the line on face; now engage the rack into gear with the pinions by sliding the spring washers outward, and the Chuck is ready for universal work, and perfectly true. This Chuck has a large hole in centre, and will allow a drill or reamer to pass through work without injury.

Fig. 5 represents the style known as the No. 1, or reverse jaw. This Chuck is used for holding drills, screws, pipes, etc., and is very convenient for this class of work, also for hand-tool work, brass finishing, etc.

Fig. 6 represents style No. 2, or inside jaw, and is the Chuck commonly used on screw machines, universal millers, also for holding drills, reamers, dies, or other tools desirable to be held firmly and true.

These Chucks will be furnished without the combination when so ordered, and when thus supplied will be universal only. They will be known as the "HORTON STYLE."

HORTON LATHE CHUCK.



This cut gives a view of E. Horton's Patent Lathe Chuck, together, and in its parts. The main feature is, that the jaws are moved to and from the centre universally, by means of the geared screws and the circular wrought iron rack, which is enclosed in the deep groove or recess in the back plate, and then turning the centre faces of both front and back plates true, which, when bolted together, makes a perfectly tight casing for the gearing, so that no dirt, chips, etc., can possibly get into them to clog and injure the Chuck. When the rack is taken out, especially from the Fore Jaw, it makes a superior Independent Jaw Chuck, so that it virtually makes two Chucks combined in one. The Jaws are made solid, forged of one piece of metal of the very best quality wrought iron, and thoroughly case-hardened with animal coal.

PRICE LIST OF THE HORTON LATHE CHUCK.

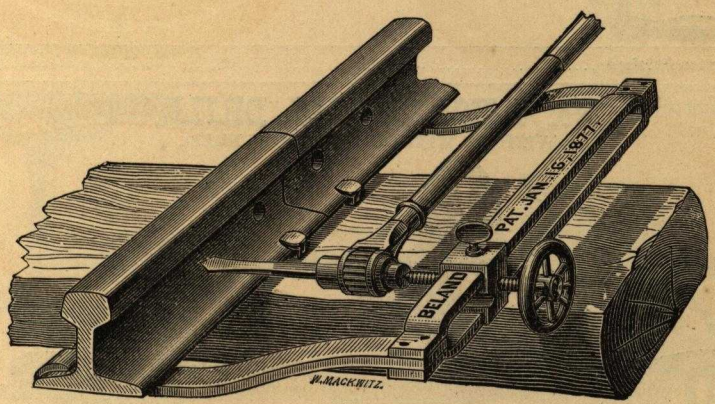
THREE JAWS.

6 inch diameter and less	$ 26 00
9 inch diameter	34 00
12 inch diameter	44 00
15 inch diameter	52 00
18 inch diameter	62 00
21 inch diameter	80 00
24 inch diameter	100 00
30 inch diameter	170 00
36 inch diameter	230 00
36 inch diameter for Car Wheels	250 00
30 inch diameter for Car Wheels	185 00

FOUR JAWS.

6 inch diameter	$ 32 00
9 inch diameter	42 00
12 inch diameter	56 00
15 inch diameter	64 00
18 inch diameter	75 00
21 inch diameter	95 00
24 inch diameter	120 00
30 inch diameter	200 00

BELAND PATENT TRACK DRILL.



THE BEST PORTABLE TRACK DRILL IN THE WORLD.

The Beland Track Drill is made entirely of wrought iron, cast steel and malleable iron, with improved slide-feed nut, as shown in cut.

Its adoption in three years by about 300 railroads should be a sufficient guarantee of its value. Some of the most prominent roads have ordered one on every section, considering it an indispensable section tool.

1st. Its exceeding convenience, effectiveness and durability commend it to those who practically understand the value and necessity of a handy and efficient drill as a section tool.

2d. It is easily adjusted to the track, and in ten seconds' time.

3d. It drills all the holes for a joint without moving the clamps, by simply sliding the feed-nut to point desired.

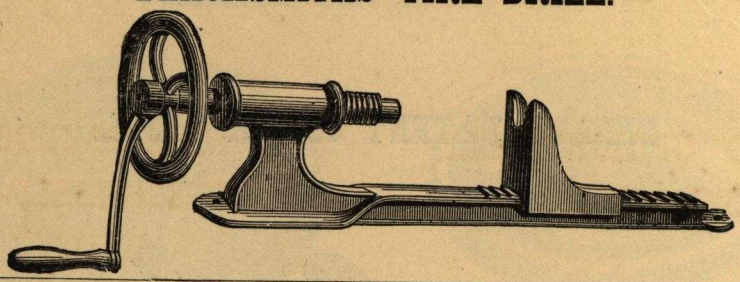
4th. It drills the rail spiked in position. In replacing spike down the rail, then apply the drill, thereby avoid delay and danger to trains.

5th. It need not be moved from place to allow trains to pass.

Samples sent, on orders, to any part of the United States, subject to return at our expense if not found satisfactory.

DRILLS.

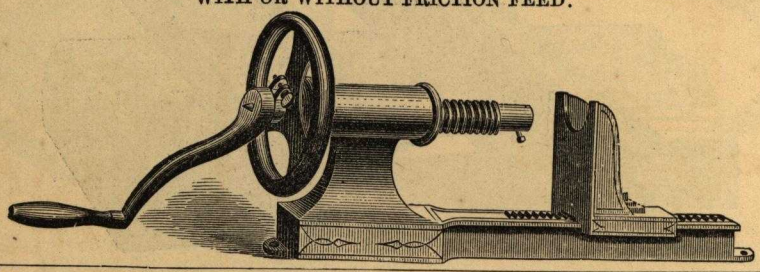
BLACKSMITHS' TIRE DRILL.



No. 10, Japanned, extra finished	$4 00

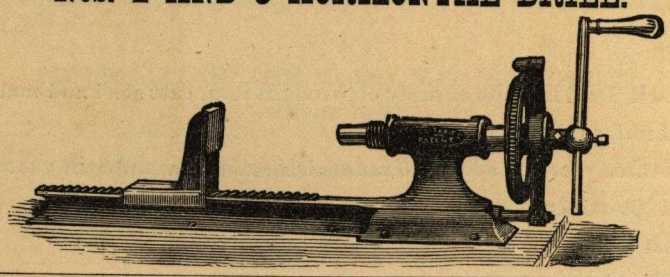
No. 4 HORIZONTAL DRILL,

WITH OR WITHOUT FRICTION FEED.



No. 4, 26 inches long, weight 33 lbs	$6 00
No. 4, 26 inches long, weight 33 lbs., with Feed	6 75

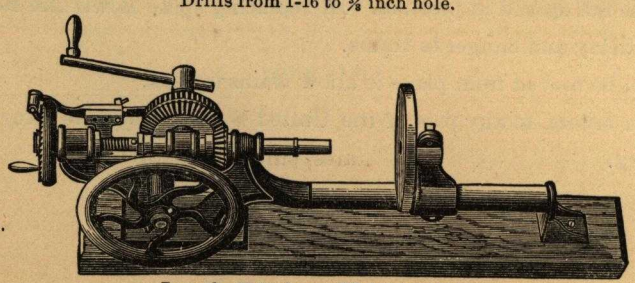
Nos. 2 AND 5 HORIZONTAL DRILL.



No. 2, 33 inches long, weight 45 lbs	$10 00
No. 2, 33 inches long, weight 45 lbs., with Balance Wheel	13 00
No. 5, 44 inches long, weight 115 lbs	17 00
No. 5, 44 inches long, weight 115 lbs., with Balance Wheel	20 00

No. 0 UPRIGHT SELF-FEEDING DRILL.

Drills from 1-16 to ⅜ inch hole.



Length, 26 inches. Weight, 30 lbs.

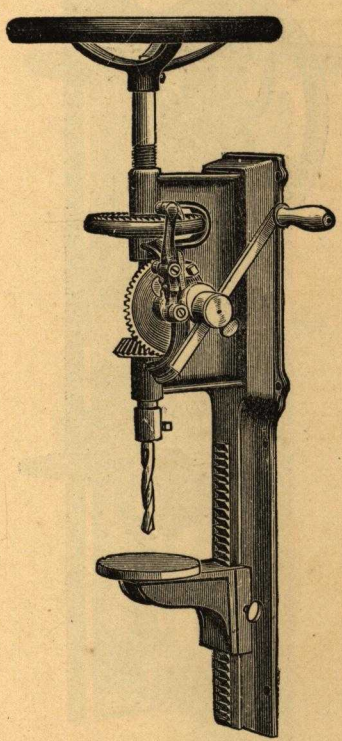
The above is fitted for a No. 2 Beach Chuck, or can be used without.

Price	$20 00

The Chuck would be extra.

THE "BOSS" UPRIGHT SELF-FEEDING DRILL.

Drills from 1/8 to 7/8 inch hole.



Patented February 4, 1873.

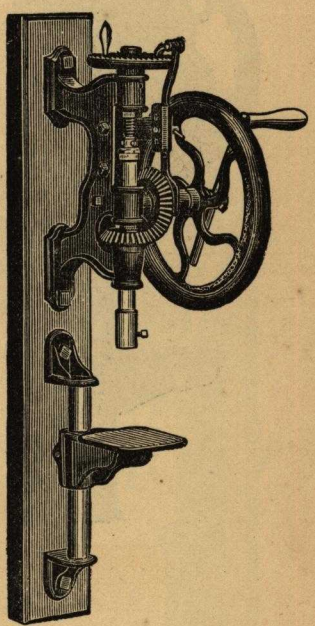
Length, 44 inches. Weight, 110 lbs.

The frame is all iron, cast in piece. It is strong, very light running and easily handled. The feed has a run of 4 inches, and 3 rates of speed. Can be used as a Horizontal, if desired.

Price	$25 00

THE BOYNTON No. 1 UPRIGHT SELF-FEEDING DRILL.

Drills from 1/8 to 3/4 inch hole.



Patented February 4, 1873.

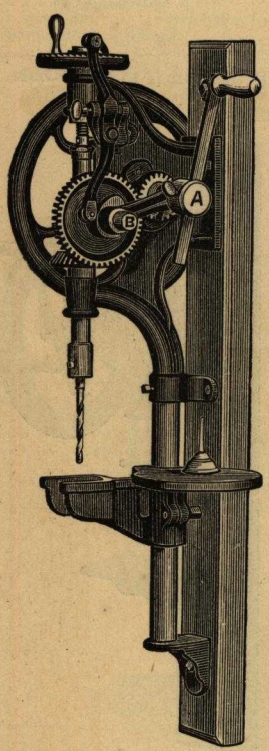
Length, 42 inches. Weight, 95 lbs.

This machine is supplied with a Patent Adjustable Feed, and can constantly be adjusted to a fast or slow feed.

Price	$28 00

THE "BOYNTON" No. 1½ UPRIGHT SELF-FEEDING DRILL.

Drills from ⅛ to 1 inch hole.



Patented May 21, 1872, Feb. 4, 1873.

Length, 44 inches. Weight, 120 lbs.

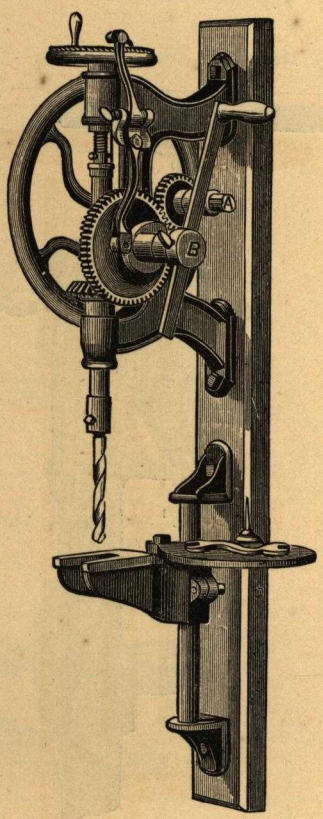
This machine has a continuous feed which may be quickly adjusted by a thumb screw to three rates of speed. A fast or slow motion may be given the Drill by changing the handle from shaft (A) to shaft (B) as desired by the operator. By this arrangement the capacity of the Drill has been increased nearly one-third.

Arranged for power with one Pulley in place of Balance Wheel without extra charge.

Price	$34 00
1 Pulley, with Balance Wheel, extra	2 00

THE "BOYNTON" No. 2 UPRIGHT SELF-FEEDING DRILL.

Drills from ⅛ to 1¼ inch hole.



Patented May 21, 1872, Feb. 4, 1873.

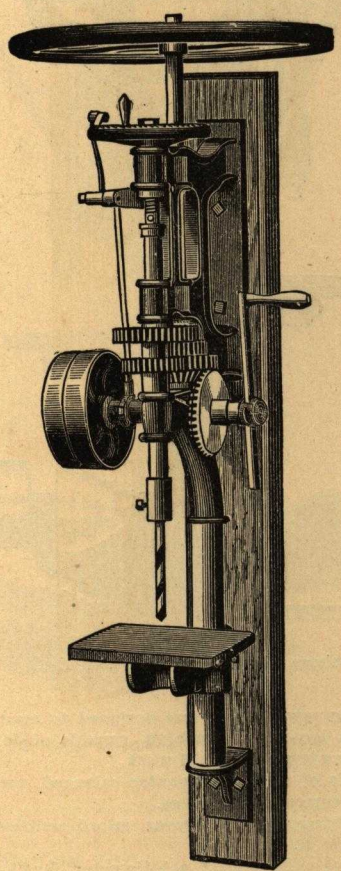
Length, 54 inches. Weight, 160 lbs.

No. 2 is similar to No. 1½, and has all the late improvements. The Swing Table, as applied to these machines, will be found useful in many ways, and much more convenient than the old method of driving them in and out with a hammer, thereby running the risk of breaking the foot-piece. It is out of the way when not in use, and may quickly be swung into position when wanted. Arranged for power with one Pulley in place of Balance Wheel without extra charge.

Price	$48 00
1 Pulley, with Balance Wheel, extra	2 00

THE BOYNTON No. 3 UPRIGHT SELF-FEEDING DRILL.

Drills from ¼ to 1½ inch hole.



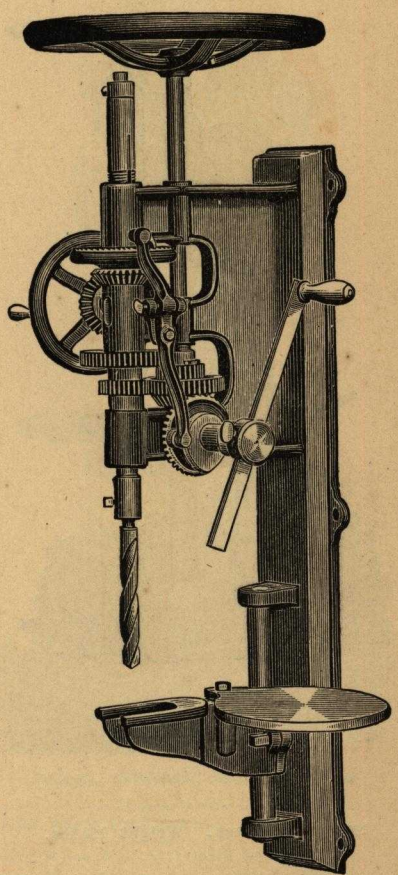
Weight, 250 lbs.

No. 3 has cut gears so arranged that a quick or slow motion may be given the drill as desired for light and heavy work, making it a desirable tool for the machine shop or factory, answering as well as higher cost machines.

Price, with Pulleys	$79 00
Price, without Pulleys	75 00

THE BOYNTON No. 4 UPRIGHT SELF-FEEDING DRILL.

Drills from ¼ to 1½ inch hole.

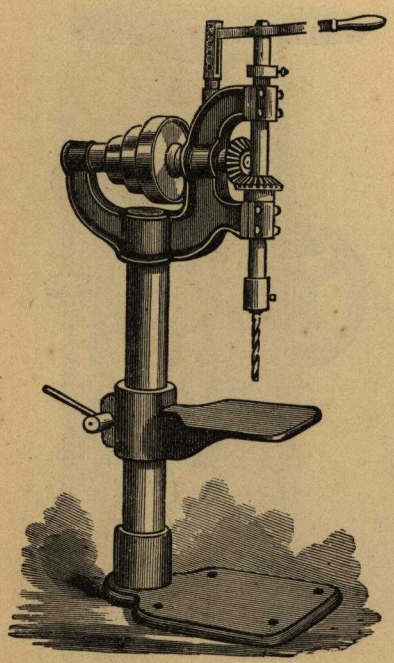


Patented February 4, 1873. Weight, 190 lbs.

No. 4 has cut gears arranged for fast and slow motion, has all the latest improvements, and is complete in all its appointments. The spindle, not being burdened with the weight of the balance wheel, is quickly operated by the hand wheel on the side.

Price	$70 00
Fitted for Power, with Countershaft, extra	10 00

No. 0 UPRIGHT LEVER DRILL.

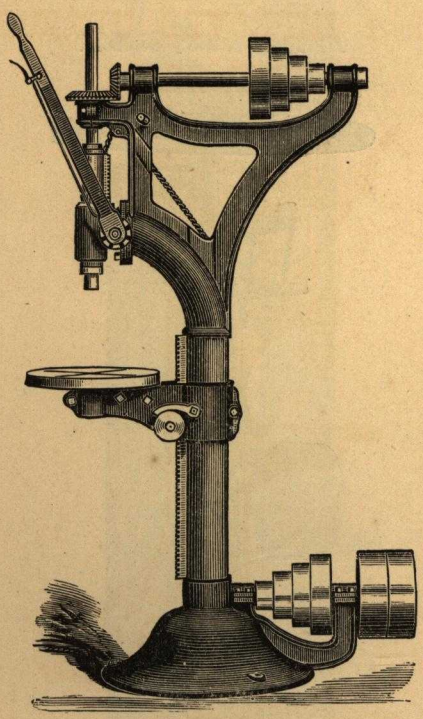


Swings, 12 inches. Weight, 100 lbs.

Price, including Counter Shaft.....	

Made to stand on bench. Convenient for light Drilling.
Write for prices.

No. 2 LEVER DRILL.



Swings, 18 inches. Weight, 460 lbs.

Made from new patterns and designed to meet the demand for a low-priced machine, capable of doing well and quickly a large amount of work.

Spindle is of steel and counter-balanced, and has a vertical movement of 7½ inches.

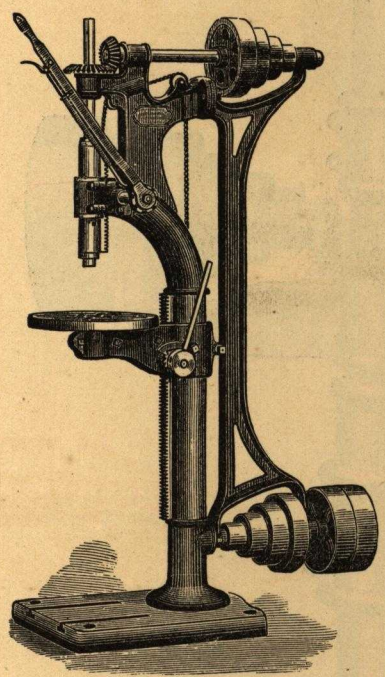
Has revolving table, and arms raised and lowered by rack and pinion.

The driving pulleys are 9 inch diameter, for 2 inch belt.

No. 2 Lever Drill.....	

Write for prices.

No. 4 IMPROVED UPRIGHT LEVER DRILL.

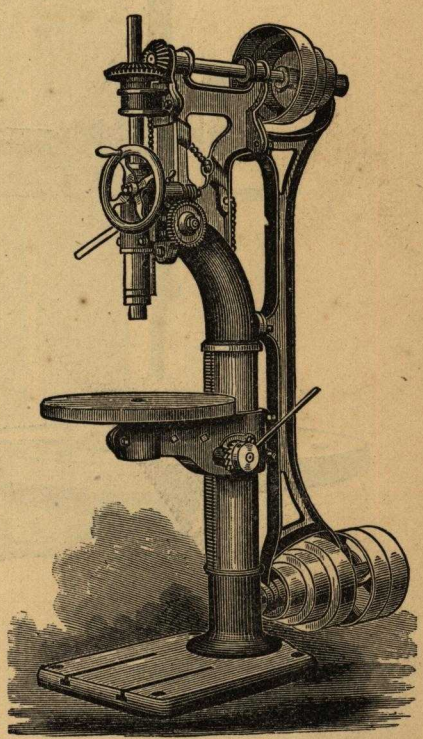


Swings, 18 inches. Weight, 460 lbs.

Price, with Lever Feed.....	
Price, with Wheel Feed.....	

Write for prices.

No. 5 IMPROVED UPRIGHT DRILL.



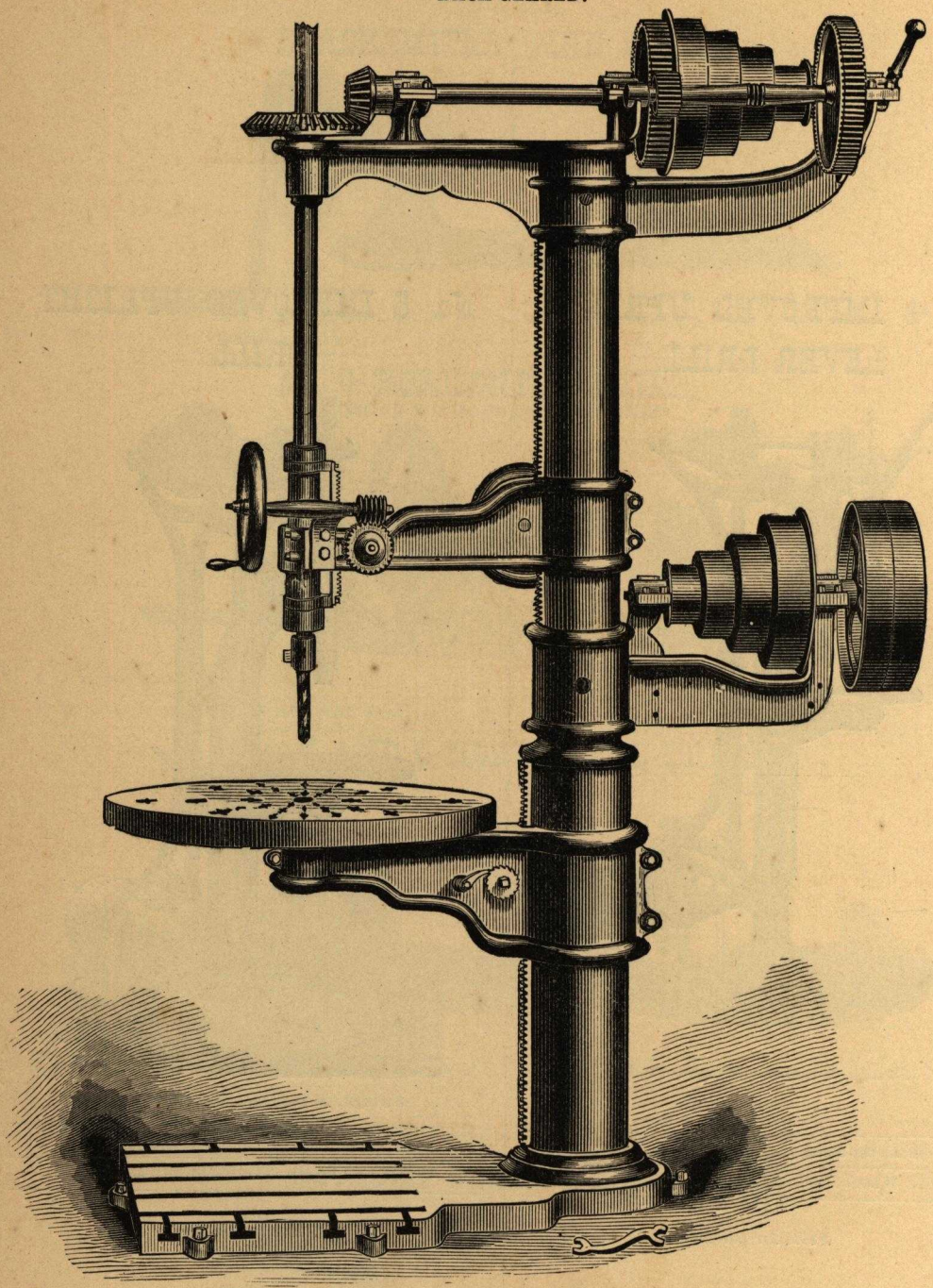
Swings, 20 inches. Weight, 650 lbs.

Price, with Lever Feed.....	
Price, with Wheel Feed and Quick Return Motion	

Write for prices.

UPRIGHT DRILL PRESS,

BACK GEARED.



No. 3 DRILL PRESS.

This is a powerful back geared tool, with four changes on cone for three-inch belt, geared the same as our 24-inch Engine Lathe, swings 44 inches, and has 2½ inch steel spindle. Is furnished with self-feed when ordered.

Weight, 3,500 lbs. Price, without Self-Feed.....

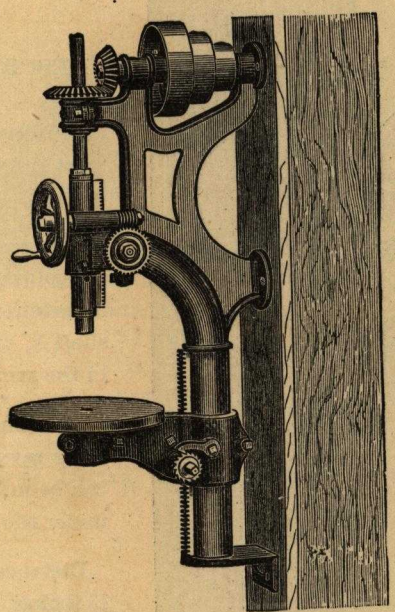
Weight, 3,600 lbs. Price, with Self-Feed.....

No. 2 1-2 DRILL PRESS.

Is of same general design as No. 3, with four changes on cone for three inch belt, swings 34 inches, and has 2¼ inch steel spindle.

Weight, 2,000 lbs. Price.....

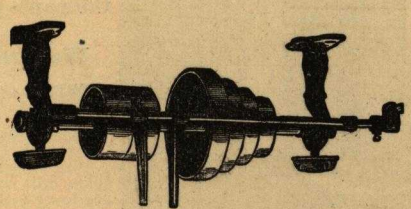
No. 3 IMPROVED UPRIGHT POST DRILL.



Swings, 18 inches. Weight, 230 lbs.

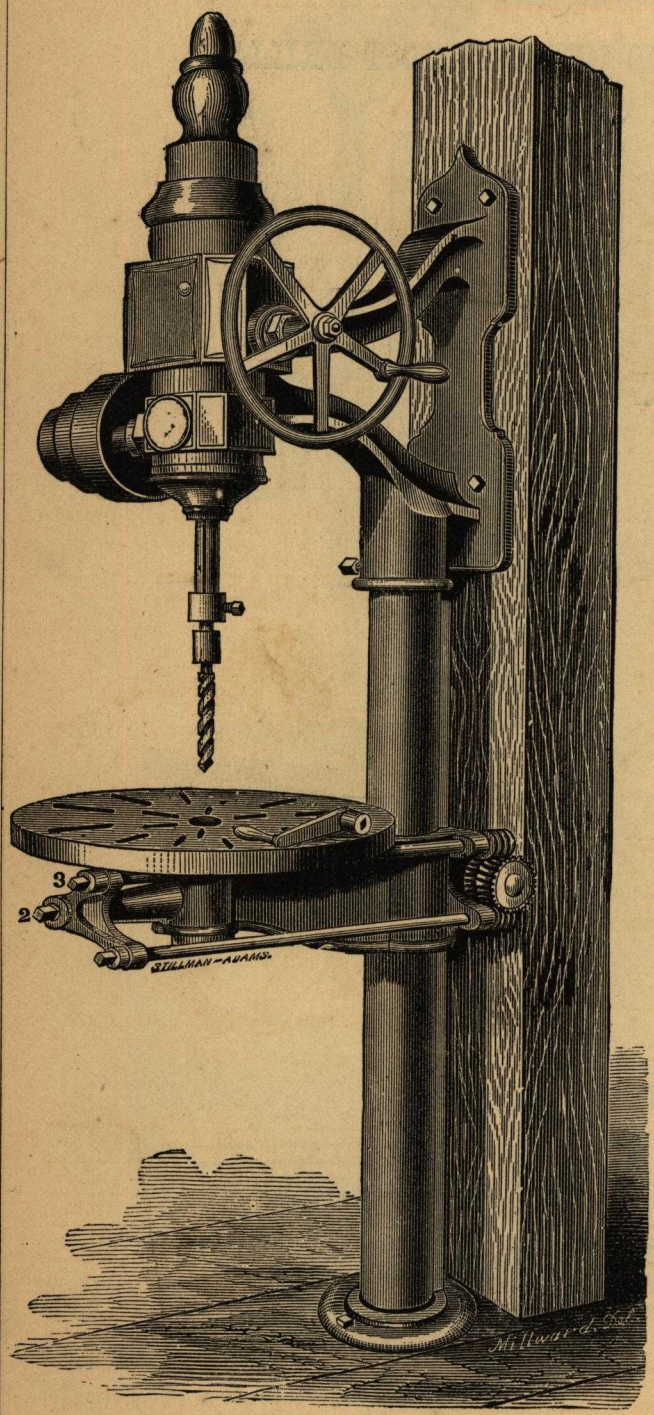
Price, including Counter Shaft.....

COUNTER SHAFT.



Write for prices.

UPRIGHT POST DRILL.



DESCRIPTION OF POST DRILL.

This is without any exception the best, most convenient and handy Drill in the market.

The arm and table raise and lower on the column by the crank shaft No. 3, and is fastened tightly at any point by the shaft 1, and the table is firmly fastened in the arm by the shaft 2.

The arm revolves to any point, and the table revolves in the arm, so that work can be made fast to the table and brought under the Drill at any point.

Distance from column to center of Drill 13 inches.

All the work is accurately fitted, and all material is of the best kind.

The Rack and Worms, and Worm Wheels, are of best Wrought Iron, cut from the solid, and are covered and protected from the dirt by a Bonnet, omitted in the illustration in order to show the working parts.

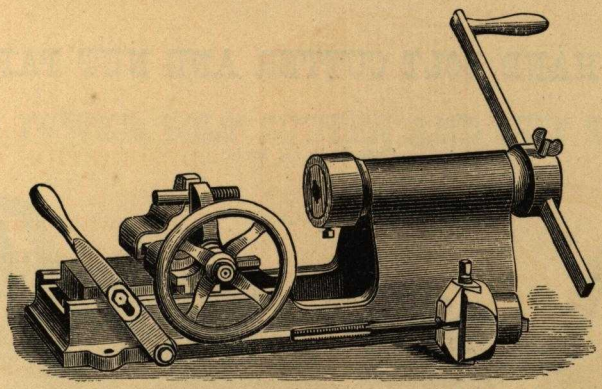
The upper gearing is protected entirely from dirt, and accessible by the removal of the top covering, or by swinging aside the name plate on the front of Drill.

We furnish with the Drill a complete separate counter-shaft.

Swings, 26 inches; can furnish same Drill, Back Geared. ☞ Write for prices.

BOLT CUTTERS.

No. 1 BOLT CUTTER AND NUT TAPPER.

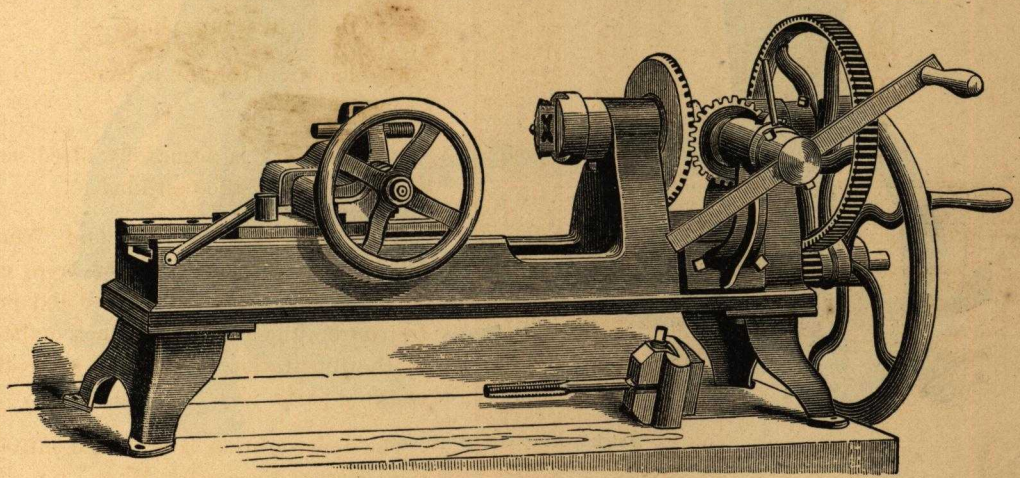


Weight, complete, 98 lbs. Cuts ¼ to ¾ inch.

Price	$60 00

With 7 Taps and Dies to match, cutting ¼, 5-16, ⅜, 7-16, ½, ⅝ and ¾ inch. Solid or Adjustable Dies furnished as desired.

Nos. 2 AND 2 1-2 BOLT CUTTER AND NUT TAPPER.



Weight, complete, 225 pounds.

No. 2 is fitted to cut 9 sizes, as follows: ¼, 5-16, ⅜, 7-16, ½, ⅝, ¾, ⅞ and 1 inch, complete, with solid Dies...	$ 95 00
No. 2, with Adjustable Dies	98 00
No. 2½ cuts 11 sizes, as follows: ¼, 5-16, ⅜, 7-16, ½, ⅝, ¾, ⅞, 1, 1⅛ and 1¼ inch complete, with solid Dies.	107 00
No. 2½, with Adjustable Dies	113 00

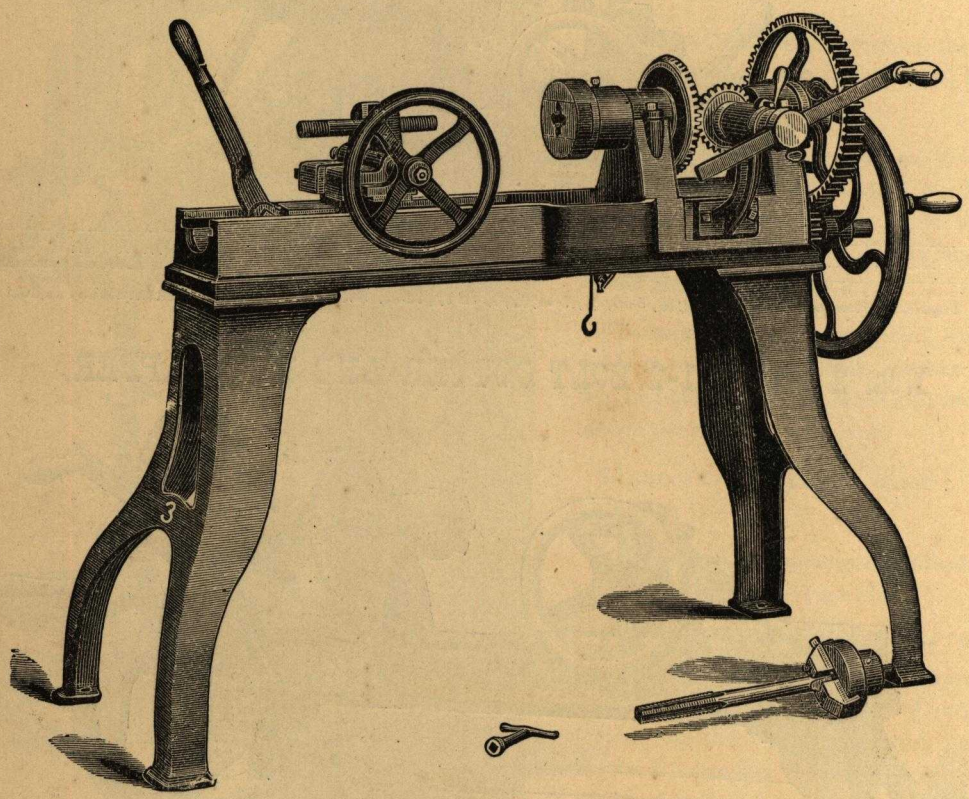
The cuts here shown represent a Bolt Cutter and Nut Tapping Machine, adapted for threading all sizes of bolts and nuts from ¼ to 1¼ inches in diameter. With these machines, large sized bolts can be threaded or cut with greater ease and facility than with any other machine in use; while small sized bolts can be cut as rapidly as with a small machine. For cutting the threads on large bolts, the machine is operated by the crank handle in the balance wheel. The side crank is used when greater speed and less power is required, as when cutting small bolts, or for backing out large ones after they have been cut. Either of these crank devices may be detached, so that the other may be used separately, or, if desired, both may be used together.

The vise jaws for holding the bolts are made from fine hardened steel, and are connected by a one-inch steel operating screw, while the Tap Jaws are also of similar construction, thus rendering these machines very strong and durable, and not liable to become quickly worn out by use. All parts of these machines are substantially and thoroughly made, and all working parts carefully and accurately fitted.

In presenting these machines to the notice of the public, we feel fully justified in saying that they have no equal as regards strength and thoroughness of construction, convenience of operation and effective practical utility; and we are confident that it will prove to the advantage of persons desiring machines of this class to consider the relative merits and capacity of these machines before adopting another.

No. 3 HAND BOLT CUTTER AND NUT TAPPER.

Cuts ⅜ to 1½ inch.



Weight, complete, 385 pounds.

Nos. 2 and 2½, mounted on long legs, same as above cut, $6 00 extra.

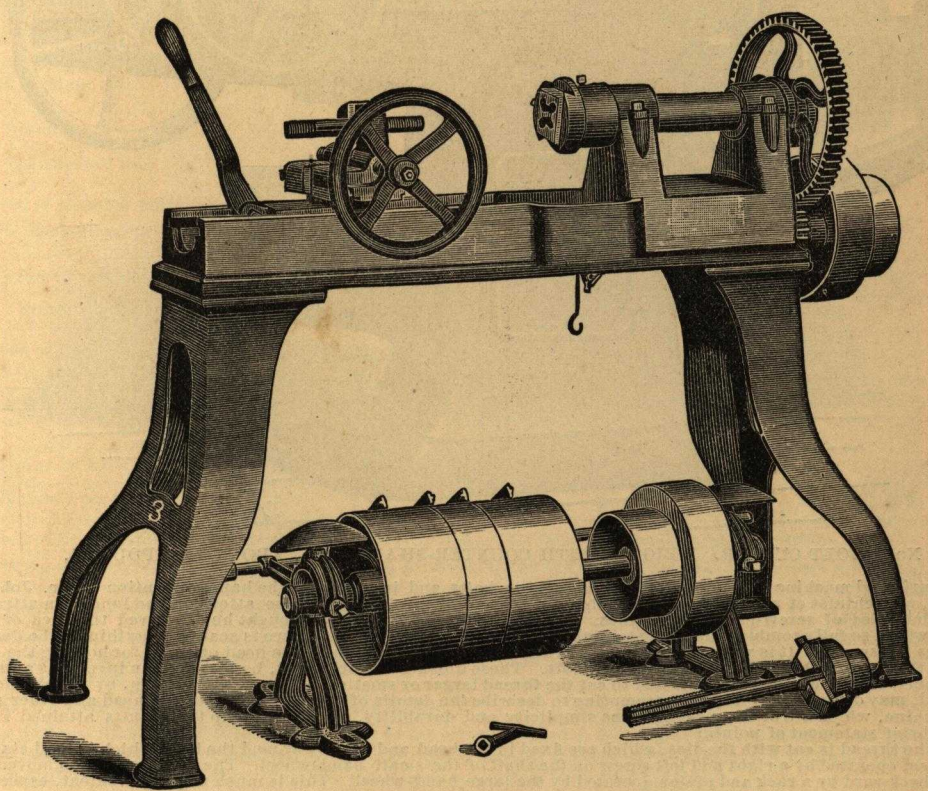
Eleven Taps and Dies are furnished with this machine, from ⅜ inch to 1½ inch. Usual assortment, ⅜, 7-16, ½, ⅝, ¾, ⅞, 1, 1⅛, 1¼, 1⅜, 1½. Furnished 1-32 over size for rough iron, unless otherwise ordered.

Price, with Solid Dies, No. 3	$150 00
Price, with Adjustable Dies, No. 3	160 00

The Whitworth or common V thread furnished, as desired.

No. 3 POWER BOLT CUTTER AND NUT TAPPER.

Cuts ⅜ to 1½ inch.

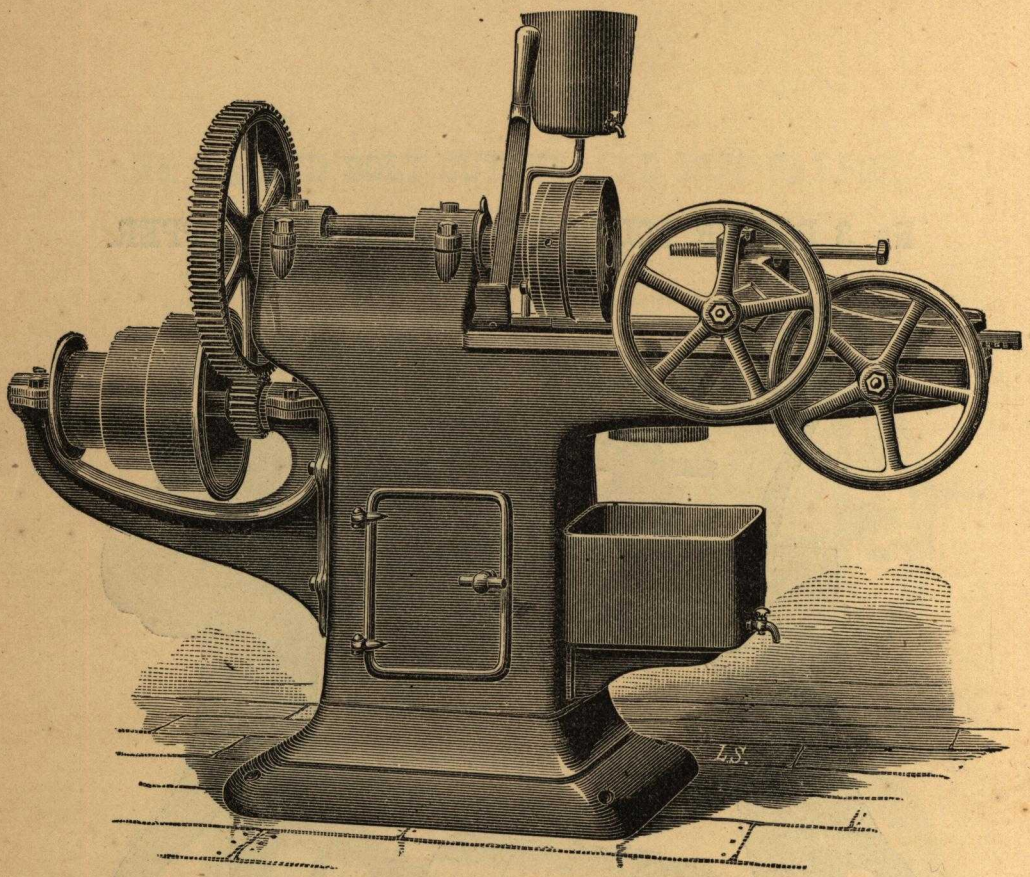


Weight, complete, 500 pounds.

The above is fitted with eleven Taps and Dies, cutting ⅜, 7-16, ½, ⅝, ¾, ⅞, 1, 1⅛, 1¼, 1⅜, 1½, rough iron size. The Cone Pulleys carry a three inch belt. The Driving Pulleys are ten inch, and will carry a two and three-quarter inch belt.

Price, with Counter Shaft	$165 00
Adjustable Dies, extra	10 00

MERRIMAN'S IMPROVED BOLT CUTTER.



No. 2 BOLT CUTTER. WEIGHT, WITH COUNTER-SHAFT, ETC., ABOUT 1,000 POUNDS.

This unrivaled machine for cutting screw threads on bolts and in nuts was the happy invention of Mr. John A. Merriman, a machinist of much experience in this department of mechanics, whose attention had long been attracted to the deficiencies of screw-cutting machines. After patient and continued thought he conceived the idea of this machine, which so fully combines all the essentials of a perfect Bolt Cutter that there is scarcely anything to be desired that it does not supply. It is very simple in its construction. Its vital portion is the head or chuck for holding the dies, which cut the thread while revolving around the bolt. These dies are movable, and, by means of an ingenious arrangement of cams, they can be readily adjusted to cut the thread larger or smaller, as the size of the tap, by which the nut is threaded, may determine. Without attempting to describe the details of the mechanism of the head and other parts of the machine, which are of the most extreme simplicity and durability, we may sum up the results attained in the following brief statement of points:

1st. The thread is cut with the dies, which are fixed in the head and revolve around the bolt, which is held stationary in a vise, operated by a right and left screw on the shaft of the small hand-wheel. The bolt carriage is moved forward and backward by a rack and pinion operated by the large hand-wheel. This is much more convenient, especially with long bolts, than to revolve the bolt.

2d. The dies cut the thread by passing over the bolt but once; they never run backward, which obviates tearing the thread off the bolt or injuring the cutting edge of the dies.

3d. When the thread has been cut as far as desired, the dies are opened by moving the lever, and the bolt is withdrawn, while the machine still continues in motion as before. Another bolt may then be inserted, and the operation continued with much saving of time and labor.

4th. The dies can be removed in thirty seconds and those for another size substituted, without turning or loosening a bolt, screw or nut, and when the dies are placed in the head of a machine, it combines every advantage of a solid die and adjustable dies.

5th. Should the dies cut too large or too small, they may be adjusted in thirty seconds to any variation, from an eighth of an inch down to the hundredth part of an inch. By this means bolts can always be made to fit the nuts, no matter how much the taps may be worn.

6th. It will cut the usual V, square, or ratchet threads, with equal facility, and at one cut.

7th. It is provided with an "index," by the use of which the machine can be instantly adjusted to cut the required size, so that the bolts can be made to fit the nuts without the vexatious "cutting and trying" that is required on most machines.

8th. It is provided with means for tapping nuts when needed, and the change from cutting threads to tapping can be made in a minute, or vice versa.

9th. In the perfection of the thread produced it is surpassed by no other machine.

10th. In rapidity it surpasses all ordinary machines, its capacity being several times as great as that of the ordinary kind.

11th. It is so simple in construction that it is not liable to get out of order.

12th. Any apprentice, of ordinary intelligence, can adjust and operate it without the least difficulty.

There are other features which we need not mention.

We manufacture three regular sizes of this Bolt Cutter, which have capacity for cutting bolts of a diameter, and with threads per inch, as shown in the accompanying schedules of size and capacity.

With each machine we send taps and dies, as per the following schedules, finished and ready for use: tap sockets for tapping nuts; the bolt and nut holders, counter shaft, pulleys and hangers; making a complete machine for screw cutting and nut tapping.

SCHEDULE OF SIZES AND PRICES.

The sizes and capacities for Cutting Bolts and Tapping the Nuts are as follows:

No. 1, Diameter of Bolt	¼	5-16	⅜	7-16	½	⅝	¾	$250 00
No. 1, Threads per inch	20	18	16	14	13	11	10	

Speed of Counter-Shaft, 125; diameter of Pulley, 12 inches, 3 inch face; weight, complete, 600 lbs.

This machine is not geared, but has a cone of three pulleys, each 3 inches broad, giving ample power and variations of speed. Intended for doing light work very rapidly.

No. 2, Diameter of Bolt	⅜	⅝	¾	⅞	1	1⅛	1¼	$325 00
No. 2, Threads per inch	13	11	10	9	8	7	7	

Speed of Counter-Shaft, 150; diameter of Pulley, 12 inches, 3 inch face; weight, complete, 1,000 lbs. (See cut, page 372.)

This size machine is intended for medium sized work. Is very effective in railroad and general machine shops, general jobbing, etc.

No. 3, Diameter of Bolt	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2	$475 00
No. 3, Threads per inch	8	7	7	6	6	5½	5	5	4½	

Speed of Counter-Shaft, 150; diameter of Pulley, 18 inches, 4½ inch face; weight, about 2,000 lbs.

This machine is double-geared, and is intended for heavy work, bridge bolts, etc.

No. 4, Diameter of Bolt.	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2¼	2½	$575 00
No. 4, Threads per inch.	8	7	7	6	6	5½	5	5	4½	4½	4	

Speed of Counter-Shaft, 75; diameter of Pulley, 18 inches, 4½ inch face; weight, about 2,600 lbs.

This is a heavily double-geared machine, so arranged as to give three speeds in gear, and three speeds from pulleys direct, with broad belt surfaces, thus fitting it for a large range of work, from very large down to moderately small, and doing any size with celerity.

No. 5, Diam. of Bolt..	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2¼	2½	2¾	3	3¼	3½	$750 00
No. 5, Threads per in.	8	7	7	6	6	5½	5	5	4½	4½	4	4	3½	3½	3¼	

Speed of Counter-Shaft, 100; diameter of Pulley, 18 inches, 4½ inch face; weight, about 2,800 lbs.

This machine is back-geared like a lathe, has six speeds, and the holding vise has two screws geared together, so that it is capable of holding securely the heaviest work, or of tapping the heaviest nuts. It is intended for doing a very large range of work, from quite small to very heavy bolts.

Variations from the foregoing schedule of sizes can be made, within certain limits, so as to provide for cutting bolts of larger or smaller sizes at small advance in price, to cover additional dies, taps, tap sockets and sundry minor changes necessitated by such additions.

Cuts or Photographs of any size furnished on demand.

The National Standard of Threads, as shown in the schedules above, being the standard adopted and recommended by the Franklin Institute of Pennsylvania, and now rapidly coming into use, is the standard which we follow; and dies and taps will be cut and fitted accordingly to every machine, unless otherwise ordered.

Hobs for recutting dies will be sent only on special order.

With all machines are furnished dies and taps per schedules above; sockets for holding the taps when tapping nuts; also, counter-shafts, pulleys, hangers, wrench, etc., ready for the belt.

PRICE LIST OF DIES.

BLANK DIES.

Bolt Cutter, sizes	1	2	3
Three Dies, per set	$1 50	2 00	2 50
Four Dies, per set	$2 00	2 50	3 25

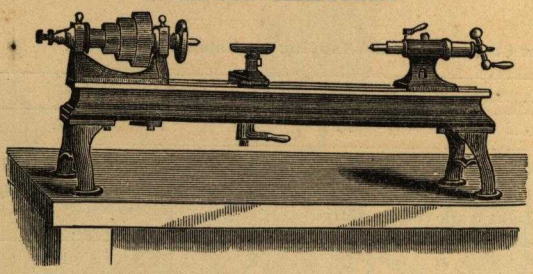
FINISHED DIES.

Bolt Cutter, sizes	1	2	3
Three Dies, per set	$2 00	2 50	3 25
Four Dies, per set	$2 50	3 25	4 25

In ordering Dies, state the size of machine and number of Dies per set. Duplicate Dies, either finished or blank, can be furnished at any time, to fit any machine.

LATHES.

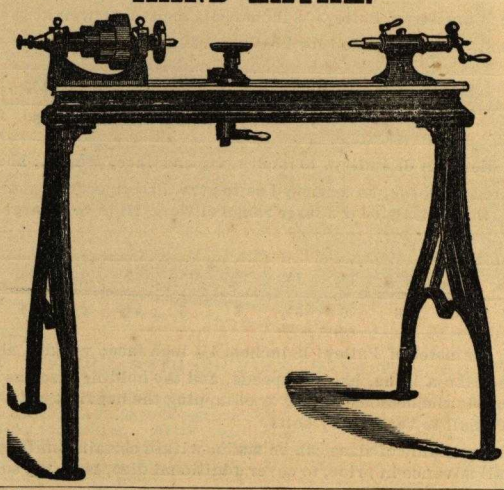
BENCH LATHE.



Length of Bed, feet	3½	3	4	5
Swing, inches	9	11	11	11
Distance between Centres, inches	24	14	26	38
Weight, pounds	160	210	235	260
Price	$65 00	85 00	87 00	90 00

Hollow Steel Spindles in Head. Back Gears, extra, $25 00. Above prices include Counter-shaft.

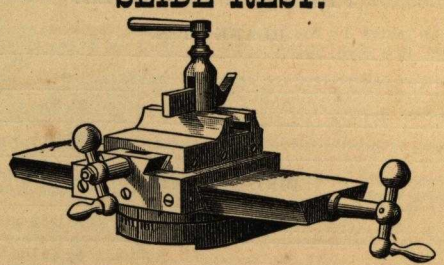
HAND LATHE.



Length of Way, feet	3½	3	4	5	4	5	6	8	4	5	6	8
Swing, inches	9	11	11	11	14	14	14	14	16	16	16	16
Distance bet. Centres, in.	24	14	26	38	22	34	46	68	22	34	46	68
Weight, pounds	200	320	340	380	500	570	640	710	560	630	700	770
Price	$ 65 00	87 00	90 00	93 00	114 00	117 00	120 00	128 00	130 00	134 00	138 00	145 00

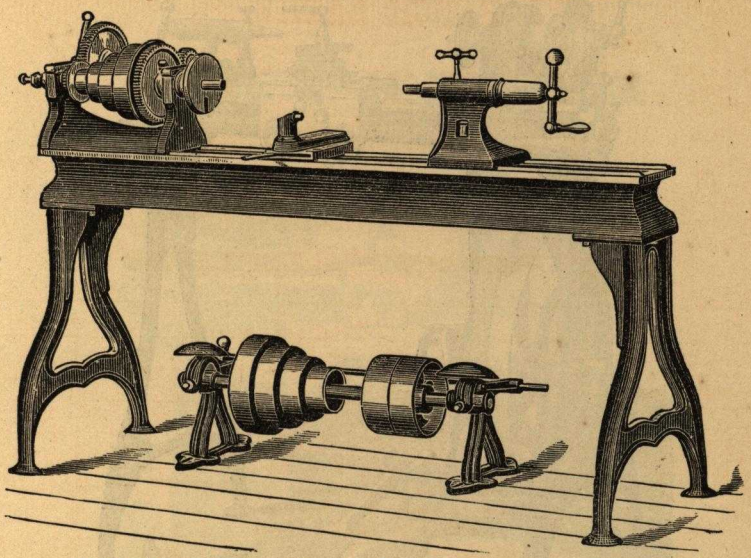
These Lathes have Hollow Steel Spindle in Head. Back Gears for 11 and 14 inch swing Lathes, extra, $25 00. Back Gears for 16 inch swing, extra, $30 00. These prices include Counter-shaft. Counter-shaft, $8 00.

SLIDE REST.



Length, inches	9	12	15	15
Swing, inches	9 and 10	11	14	16
Price	$32 00	35 00	52 00	55 00

BACK GEARED HAND LATHE.



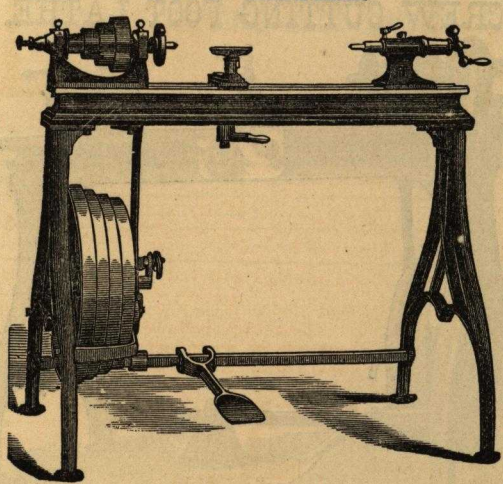
This cut represents our 14 and 16 inch Back Geared Hand Lathes.

Length of Way....	4 ft.	5 ft.	6 ft.	8 ft.
Swing.....	14 in.	14 in.	14 in.	14 in.
Dis. bet. Centres..	22 in.	34 in.	46 in.	70 in.
Weight.....	500 lbs.	570 lbs.	640 lbs.	710 lbs.
Price.....	$140 00	143 00	146 00	153 00

Length of Way....	4 ft.	5 ft.	6 ft.	8 ft.
Swing.....	16 in.	16 in.	16 in.	16 in.
Dis. bet. Centres..	22 in.	34 in.	46 in.	68 in.
Weight.....	560 lbs.	630 lbs.	700 lbs.	770 lbs.
Price.....	$160 00	164 00	168 00	175 00

These Lathes have Hollow Steel Spindles in Head, and the Cones are turned inside as well as out.

FOOT LATHE.

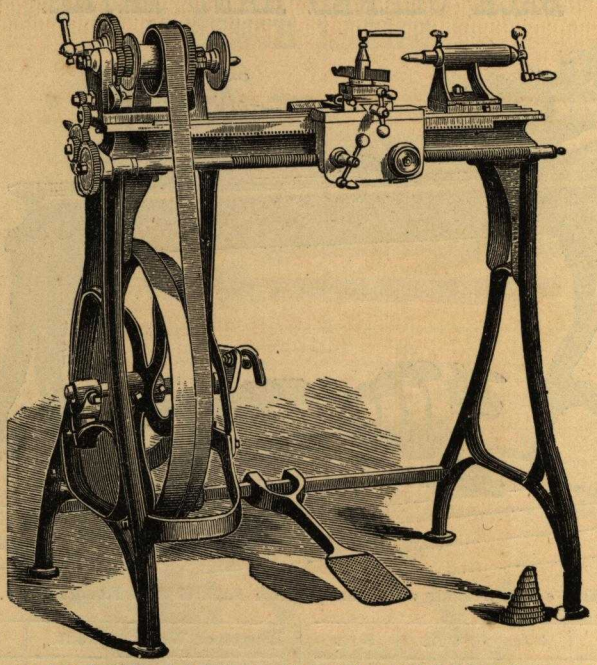


Made from new and improved Patterns. Hollow Steel Spindle in Head.

Length of Way.....	3½ feet.	3 feet.	4 feet.	5 feet.
Swing.....	9 inches.	11 inches.	11 inches.	11 inches.
Distance between Centres.....	24 inches.	14 inches.	26 inches.	38 inches.
Weight.....	300 pounds.	375 pounds.	400 pounds.	440 pounds.
Price.....	$85 00	107 00	110 00	113 00

We furnish these Lathes, with Back Gears, for $25 00 extra.

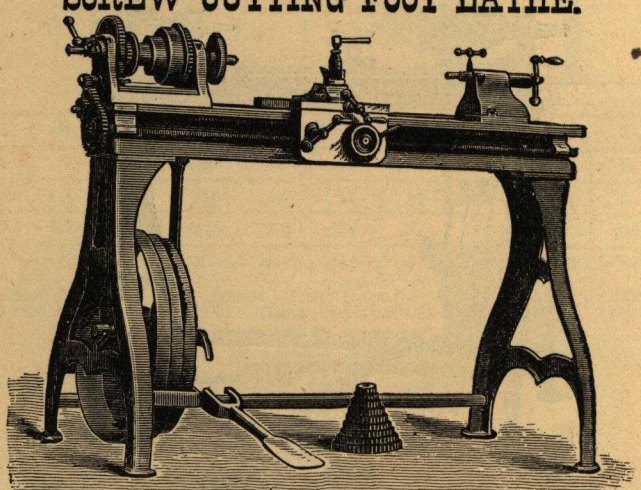
NEW SCREW CUTTING FOOT LATHE.



It has all the conveniences of modern Engine Lathes. Cuts right and left hand threads 5 to 48 to the inch, and feeds both ways. Has Gauge for screw cutting. Tail Stock sets over for turning tapers. It is well made, and of the best material.

Length of Way, feet	3	4	5
Swing, inches	9	9	9
Distance between Centres, inches	18	30	42
Weight, pounds	300	350	400
Price	$125 00	130 00	135 00

SCREW CUTTING FOOT LATHE.

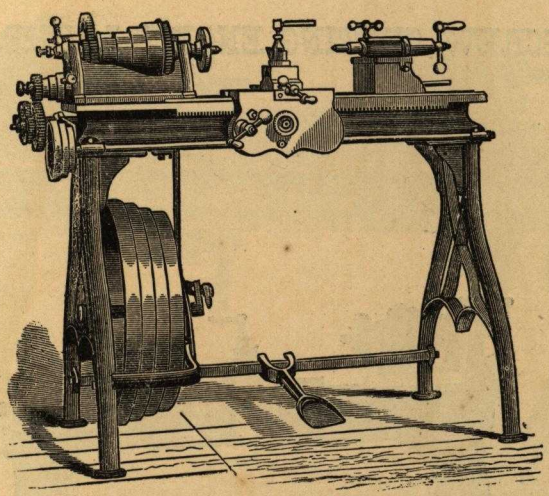


All the working parts are well and thoroughly made, and of the best material. It has Hollow Steel Spindle in the head and all the conveniences of a first-class Engine Lathe, and the foot motion is of the most approved design.

Length of Way, feet	4	5	6
Swing, inches	11	11	11
Distance between Centres, inches	24	36	48
Weight, pounds	600	650	700
Price	$170 00	175 00	180 00

These Lathes will be furnished with Counter-shaft without foot motion, at the above prices.

SCREW CUTTING FOOT LATHE.



This Lathe is made from new and improved patterns. It has Hollow Steel Spindle in head, rod and friction feed, screw with open and shut nut on back side, and cuts from 6 to 120 threads to the inch.

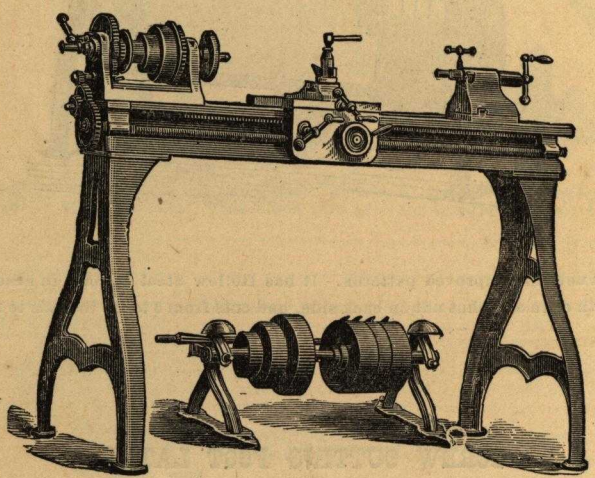
SCREW CUTTING FOOT LATHE.

Length of Way, feet	4	5	6
Swing, inches	12	12	12
Distance Between Centres, inches	22	34	46
Weight, pounds	650	675	700
Price	$290 00	295 00	300 00

SAME LATHE, WITHOUT FOOT POWER AND WITH COUNTER-SHAFT AND PULLEYS.

Length of Way, feet	4	5	6
Swing, inches	12	12	12
Distance between Centres, inches	22	34	46
Weight, pounds	550	575	600
Price	$270 00	275 00	280 00

SCREW CUTTING ENGINE LATHE.

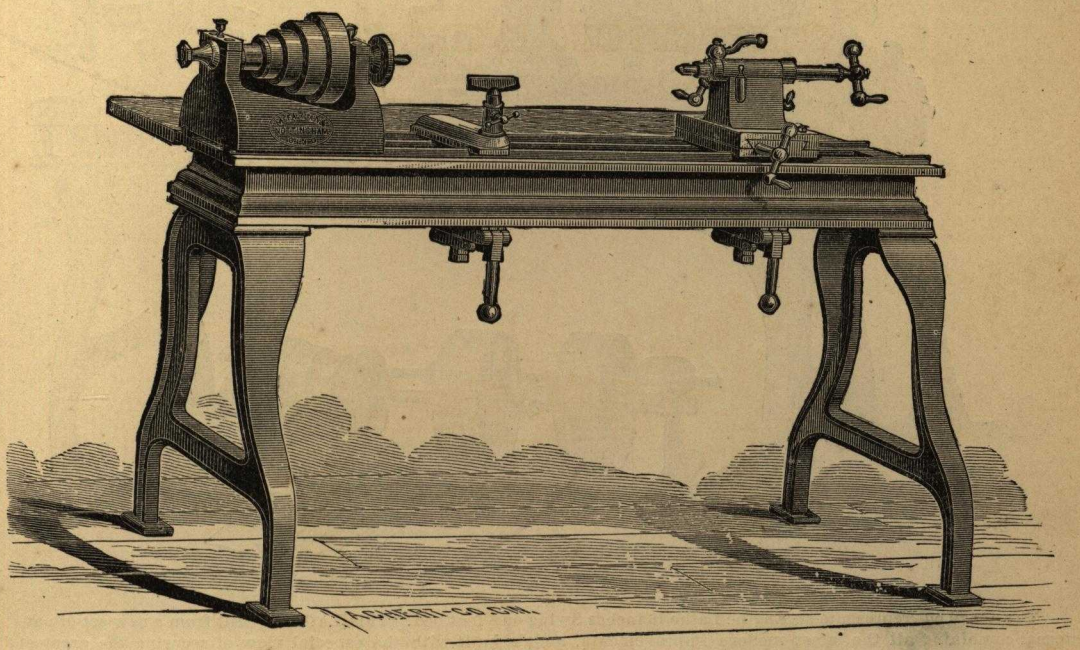


Designed to meet the demand for an accurate working Lathe at a low price. All the working parts are well and thoroughly made, and of the best material. It has Hollow Steel Spindle in the head and all the conveniences of a first-class Engine Lathe, with Counter-Shaft and Pulleys.

Length of Way, feet	4	5	6	4	5	6
Swing, inches	11	11	11	12	12	12
Distance between Centres, inches	24	36	48	22	34	46
Weight, pounds	620	650	775	550	575	600
Price	$170 00	175 00	180 00	270 00	275 00	280 00

FOX OR HAND LATHE,

FOR BRASS WORK.



DESCRIPTION OF FOX OR HAND LATHE FOR BRASS WORK, WITH COUNTER-SHAFT AND PULLEYS.

The Spindles are of the best steel.

The various parts of the Lathe are of good proportions, stiff and especially adapted to the work intended. The Spindle runs in the best brass composition boxes, perfectly fitted.

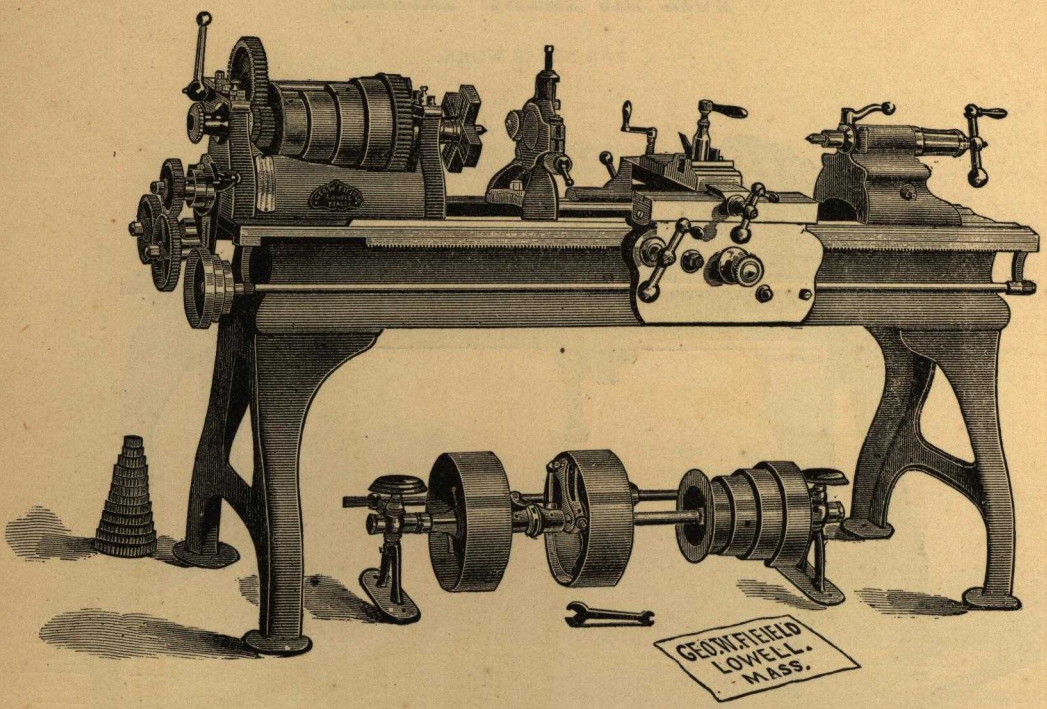
The Rest and Tail Head are firmly fastened at any point by compound wedge devices, operated by the handles shown in cut. The Poppet Spindle is firmly clamped in a true line with the Main Head Centre by the device shown. It is fed by a screw through its whole length. For drilling purposes, it is provided with a Worm and Crank Feed, direct and very powerful. This Drill Feed is thrown in or out of gear by the small Hand Lever just under the Poppet Head Spindle.

The Dove Tail Set-Over is convenient, firmly gibbed and adjustable for wear.

The Drill Feed is adjustable vertically in its entirety, insuring there being no lost motion by wear or otherwise, and has a Sleeve-Bearing 4 inches long.

Write for prices.

FIFIELD'S ENGINE LATHES.



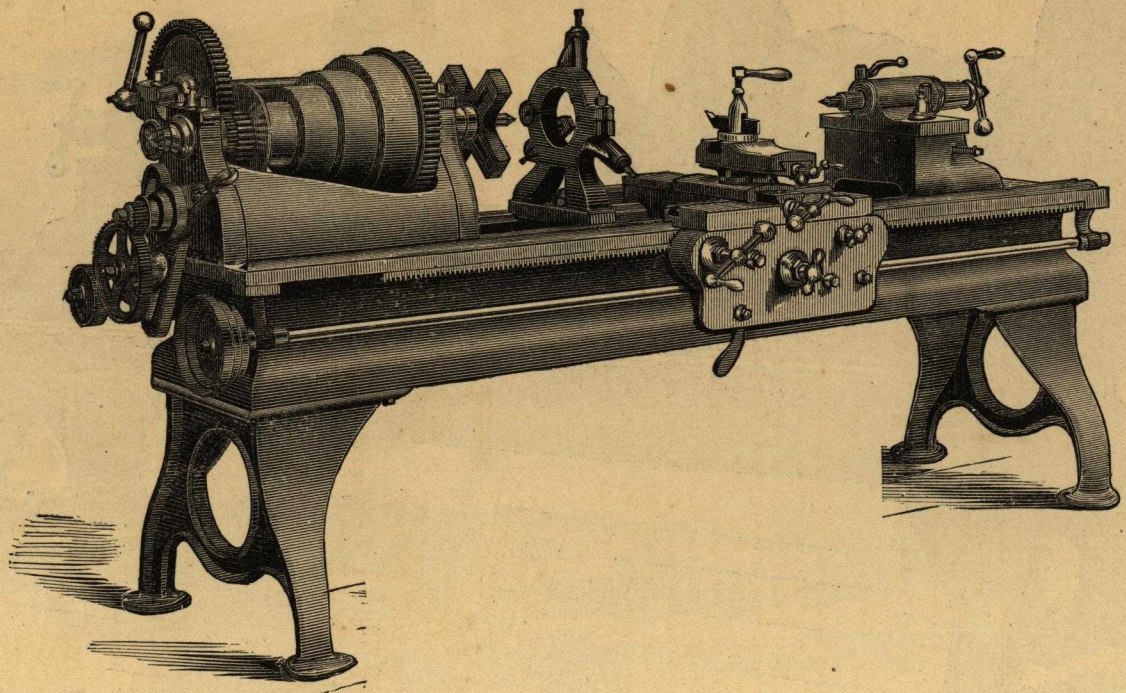
The above cut represents an Engine Lathe 16 inches Swing on 6 foot bed. This Lathe is built from a new set of patterns, combining all the latest modern improvements, and is built with the especial view of securing the greatest strength and solidity, and at the same time avoiding the great fault of making it clumsy. This Lathe is fitted with a strong Gibbed Carriage, with a raising Screw, so as to adjust the height of the cutting Tool with ease and accuracy. The feed is Rod and Friction, and is unusually strong and durable, and not subject to many annoyances that friction feeds have given users formerly. The Tail-stock is fitted with a new fastening, so constructed that it can be tightened or loosened in an instant and at the same time hold the Tail-stock perfectly firm. This size of Lathe is built with Back-Gearing, Screw-Cutting, Rod and Friction Feed, inside Power Cross Feed, Hollow Spindle, Double Gibbed Carriage, with a Raising Screw, new fastenings for Tail-stock, Patent Friction Pulley on Counter, and with each Lathe is furnished large and small Face-plates, Centre-rest, Counter complete, Wrenches, etc. The hole through line spindle is 11-16 diameter, unless otherwise ordered; but, with an extra charge of $10, can be made 1¼ diameter. Beds can be furnished from 4 to 12 feet in length.

PRICE LIST OF ENGINE LATHES.

Swing Over Ways. Inches.	Length of Bed. Feet.	Turns. Feet.	Turns. Inches.	Weight. Lbs.	Price, with Screw Gearing.	Price for Additional foot of Bed.
16	6	3	6	1,450		$10 00
18	6	3	3	2,000		12 00
20	8	4	4	2,300		14 00
22	8	4	3	2,600		15 00
24	10	6		3,600		17 00
26	12	7		4,100		20 00
28	14	9		5,500		25 00
33	12	7	6	6,000		30 00
36	14	8		7,800		33 00
48	18	11		14,000		50 00

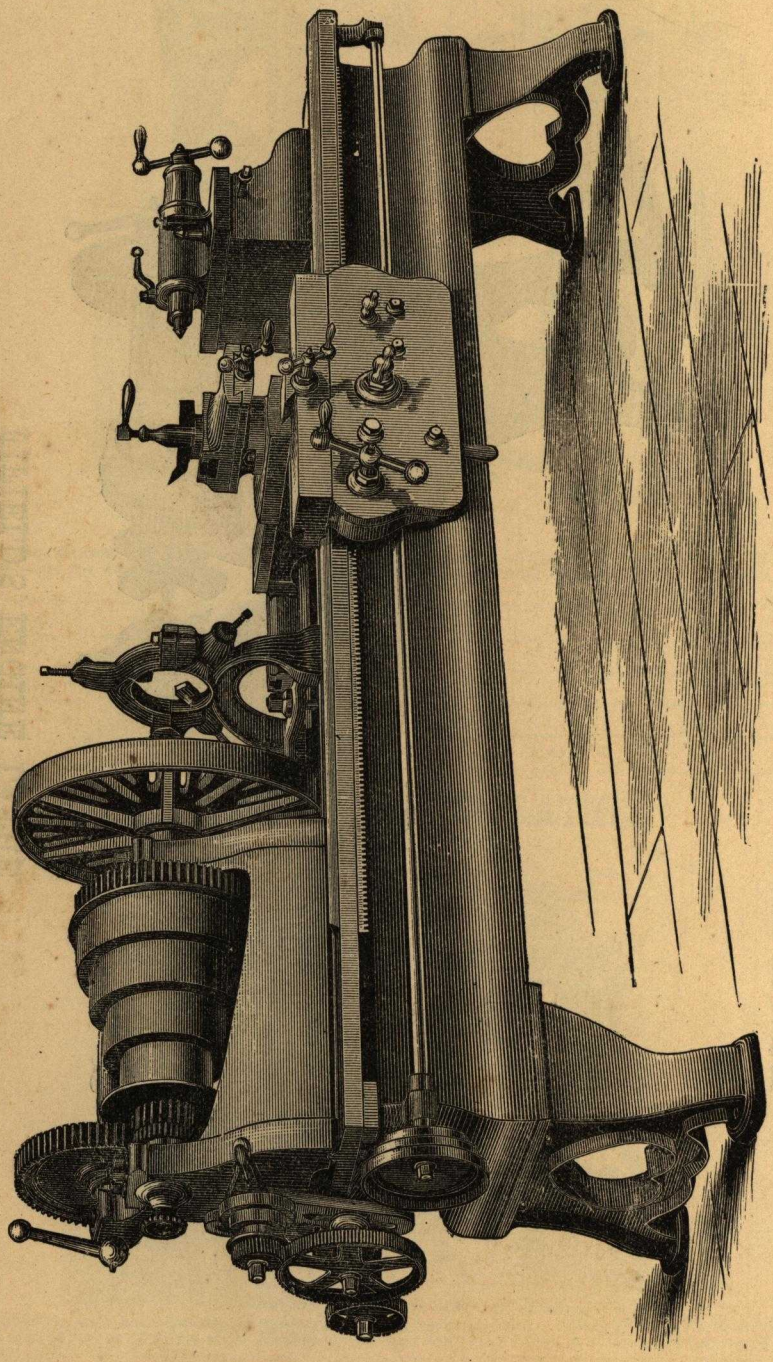
Extra for 1¼ inch hole in Line Spindle, $..... All sizes of Engine Lathes, from 16 to 48 inches swing, a specialty. Write for prices.

FIFIELD'S ENGINE LATHE.



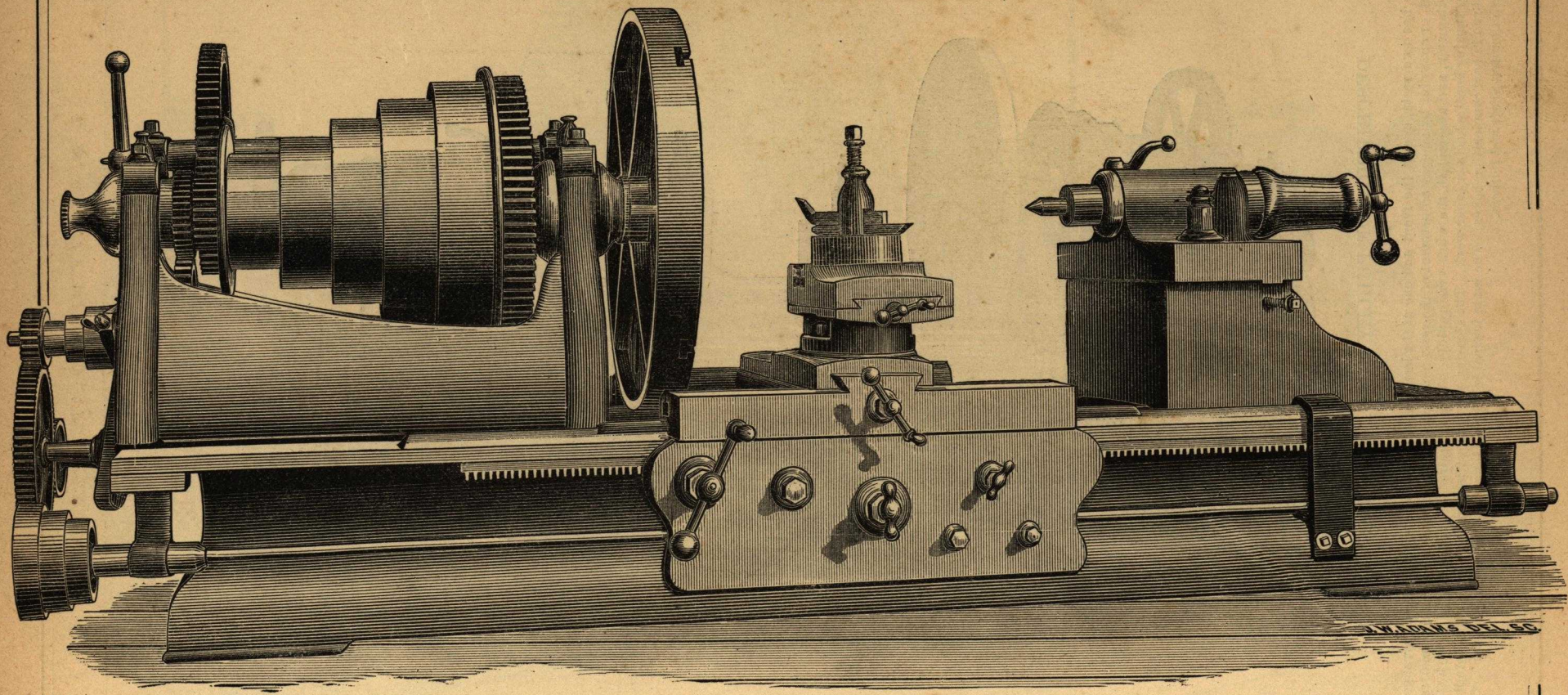
ENGINE LATHE—20 INCHES SWING. FOR PRICES AND DESCRIPTION, SEE PAGE 380.

FIFIELD'S ENGINE LATHE.



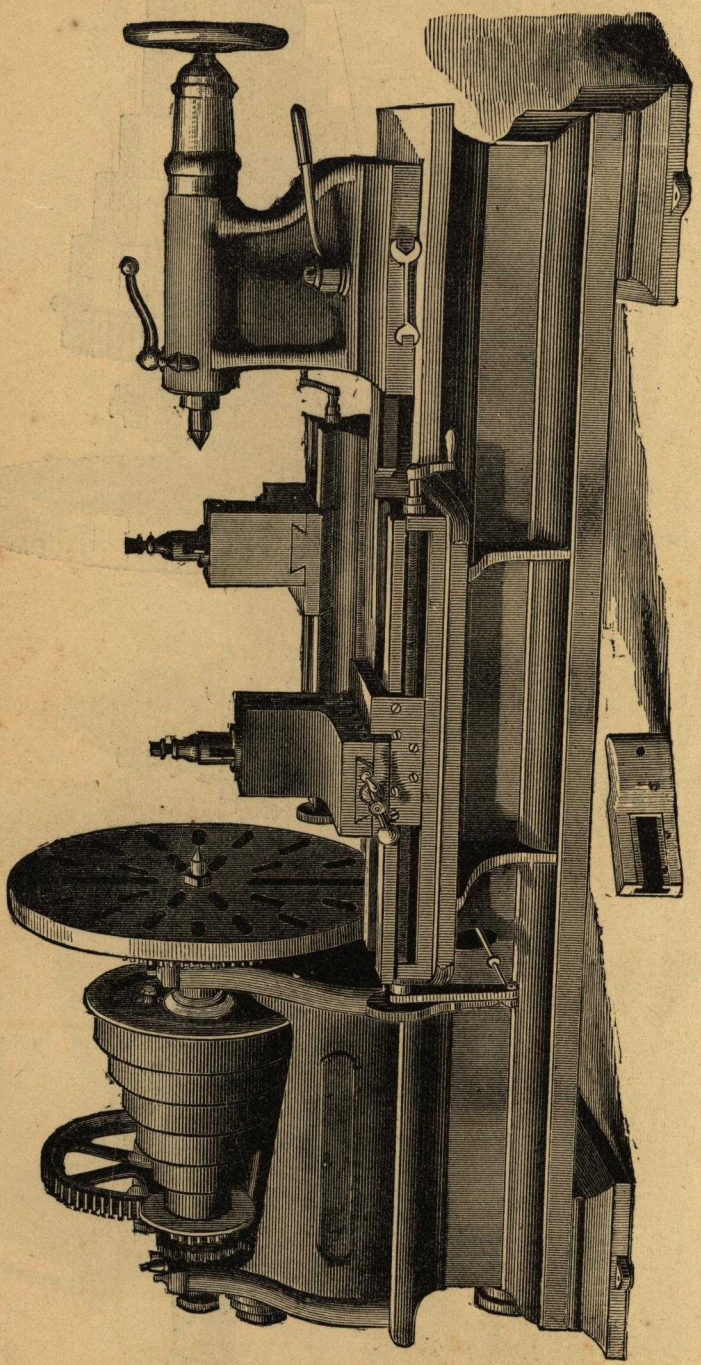
ENGINE LATHE—28 INCHES SWING. FOR DESCRIPTION AND PRICES, SEE PAGE 380.

FIFIELD'S ENGINE LATHE.



ENGINE LATHE—48 INCHES SWING. FOR DESCRIPTION AND PRICES, SEE PAGE 380.

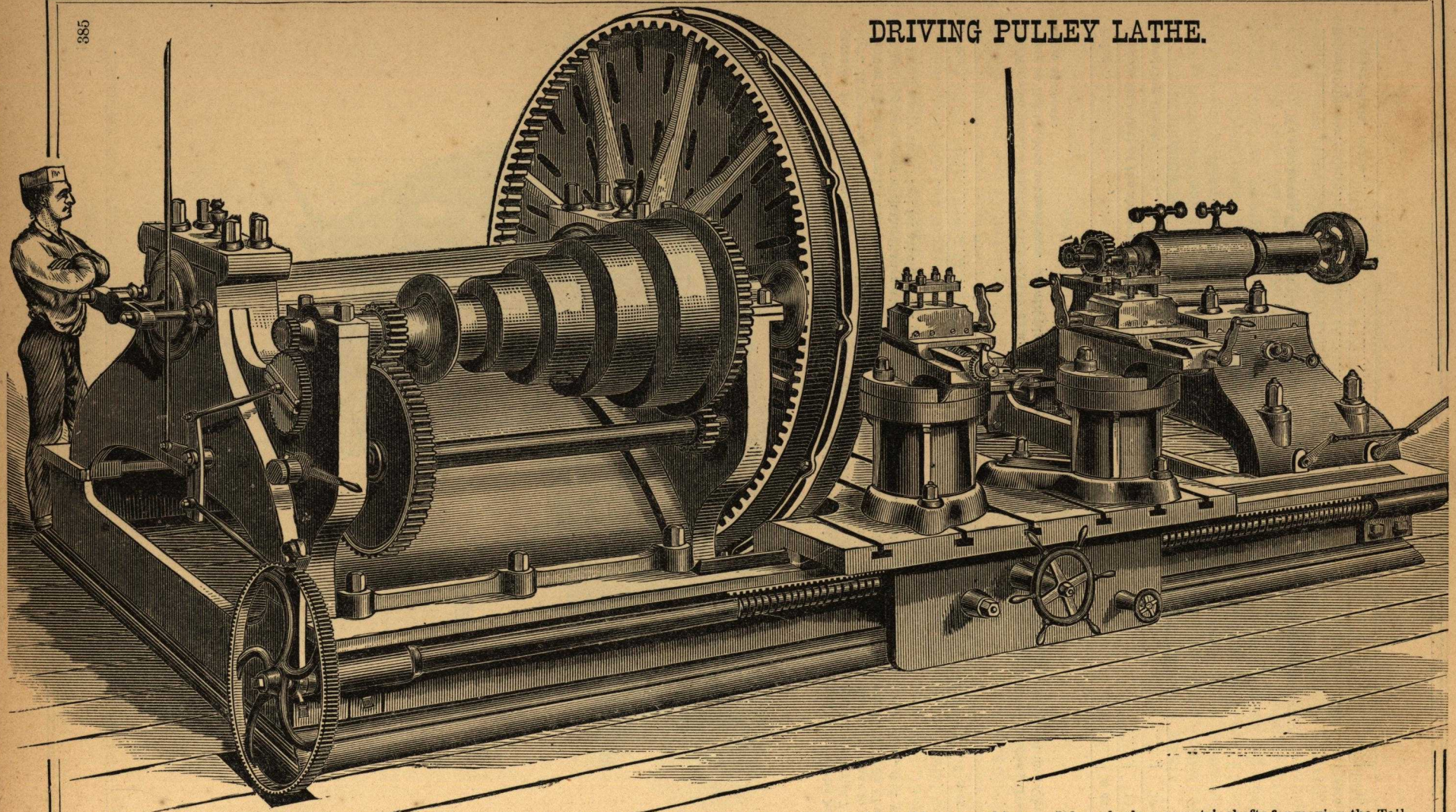
PULLEY TURNING LATHE.



DESCRIPTION OF PULLEY TURNING LATHE.

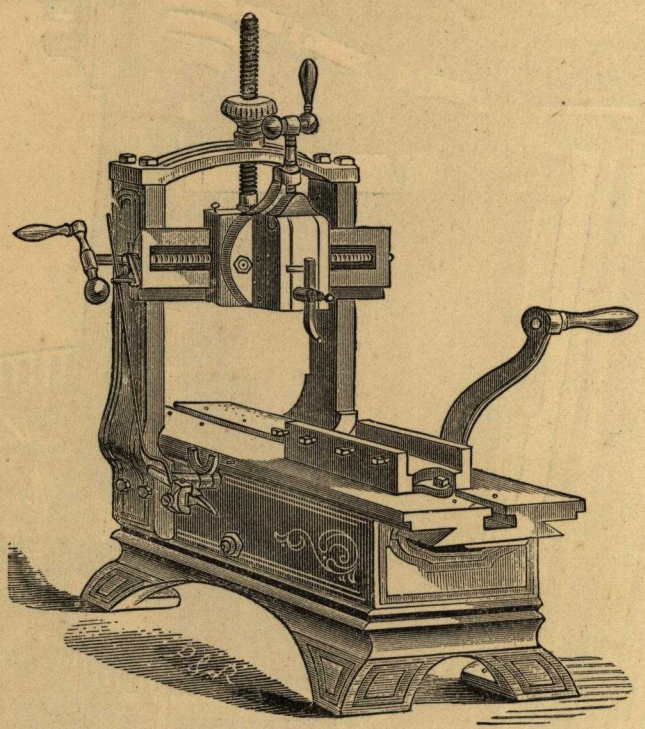
This Lathe has two rests, one at the front and one at the back, with independent variable feed, arranged to turn pulleys straight, or crowning by an easy adjustment of the rests and feed. Will turn pulleys from the smallest size up to 50 inches in diameter, and accomplish the work very rapidly. When required, we make the Lathe with Compound Rest at front for turning bevel wheels or taper work. The Gearing throughout is very powerful. The Spindles are of forged steel and run in best composition boxes. The main journal is 7 inches long and 4 inches in diameter. The Lathe is furnished with Counter-Shaft and Pulleys.

DRIVING PULLEY LATHE.



The above cut represents our new 88 inch Swing Driving-Wheel Lathe. It has sufficient power and strength for working all heavy machinery. It has wheels on eccentric shafts for moving the Tail Block with ease, an improved quartering bar for boring Crank Pin Eyes, and two Tool Posts, when desired. An attachment for turning Crank Pins, at extra cost, without removing the wheel, will be put on, when desired. Weight, 34,000 pounds. Write for prices.

HAND PLANER.



The above cut represents a small Hand Planer, for the use of model makers and machinists, and others who have occasion to do small work in metal. It is made very strong and solid, and will plane 19 in. long, 7 in. wide and 7 in. high. It is arranged for planing bevel, as well as straight work; it has a reversible Self-feed, which works either to the right or left, as desired, or may be easily thrown out of gear and the screw turned by hand, if required. A plain Chuck for holding work goes with the Planer without extra charge. The Planer, complete, weighs about 150 lbs., and will be found a very useful tool for all classes of small work.

Price	$ 75 00

We also build a smaller Planer, the same style as above, except that it has no Screw to raise the Cross-Head; being so light it does not need one. It will plane 14 in. long, 4½ in. wide, and 4 in. high. It has Self-feed and Chuck same as above.

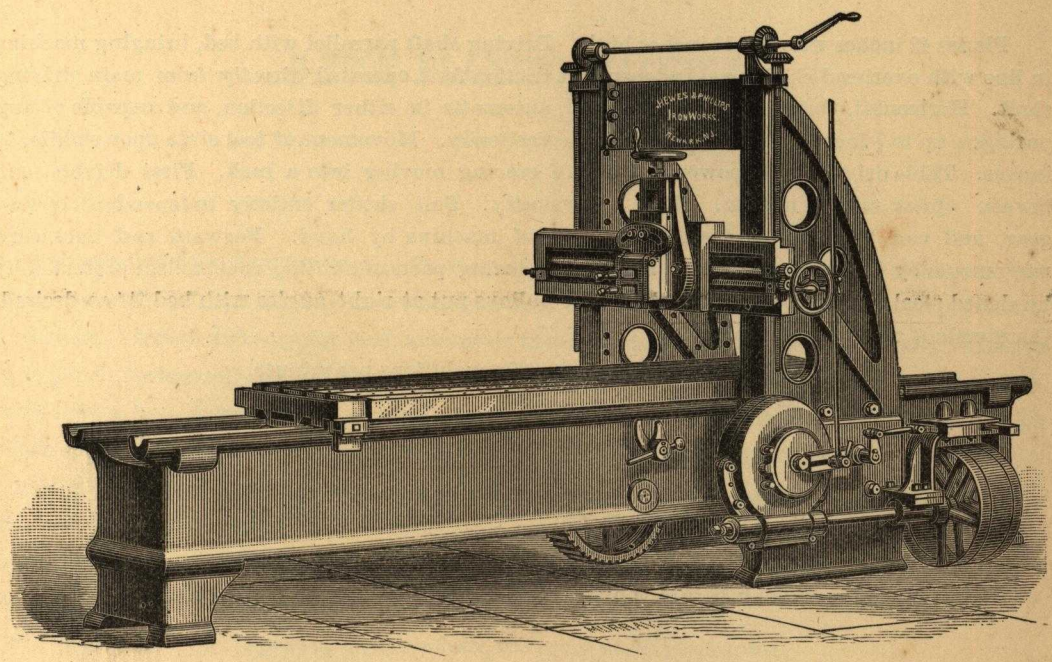
Price	$ 45 00
Centres for either of the above Planers	10 00
Revolving Chuck	10 00

POWER PLANER.

We also have a Planer the size of the large one represented above, arranged to run by power.

Price of Planer	$125 00
Counter-Shaft, extra	10 00

IRON PLANERS.



30-INCH PLANING MACHINE.

Planes 30 inches wide by 30 inches high. Driving shaft parrallel with bed, bringing machine in line with overhead shafting. Independent friction feed operated directly from main driving shaft. Horizontal, vertical and angular feed, automatic in either direction, and capable of any variation up to ½ inch horizontally and ¼ inch vertically. Movement of tool slide upon saddle, 8 inches. Table driven by a heavy train of cut gearing moving into a rack. Gear train receives its power through a worm wheel which in turn is driven by a worm upon pulley shaft. Quick return motion. High belt velocity. Belt shifter entirely independent of feed gear. Forward and backward movements by two belts separately shifted. Wearing parts of shifting mechanism protected by hardened steel surfaces. Countershaft and wrenches included.

Speed of Countershaft, 347 revolutions per minute.

36-INCH PLANING MACHINE.

Planes 36 inches wide by 36 inches high. Driving shaft parallel with bed, bringing machine in line with overhead shafting. Independent friction feed operated directly from main driving shaft. Horizontal, vertical and angular feed, automatic in either direction, and capable of any variation up to ½ inch horizontally and ¼ inch vertically. Movement of tool slide upon saddle, 9 inches. Table driven by a powerful train of gearing moving into a rack. First drivers, cut bevels. Quick return motion. High belt velocity. Belt shifter entirely independent of feed gear, and can be operated from either side of machine by hand. Forward and backward movements by two belts separately shifted. Wearing parts of shifting mechanism protected by hardened steel surfaces. Driving shaft and pulleys put at right angles with bed, if so desired. Countershaft and wrenches included.

Speed of Countershaft, 235 revolutions per minute.

42-INCH PLANING MACHINE.

Planes 42 inches wide by 42 inches high. Driving shaft parrallel with bed, bringing machine in line with overhead shafting. Independent friction feed operated directly from main driving shaft. Horizontal, vertical and angular feed, automatic in either direction, and capable of any variation up to ½ inch horizontally and ¼ inch vertically. Movement of tool slide upon saddle, 10 inches. Table driven by a powerful train of gearing moving into a rack. First drivers, cut bevels. Quick return motion. High belt velocity. Belt shifter entirely independent of feed gear, and can be operated from either side of machine by hand. Forward and backward movements by two belts separately shifted. Wearing parts of shifting mechanism protected by hardened steel surfaces. Driving shaft and pulleys put at right angles with bed, if so desired. Countershaft and wrenches included.

Speed of Countershaft, 230 revolutions per minute.

48-INCH PLANING MACHINE.

Planes 48 inches wide by 48 inches high. Other dimensions same as above.

54-INCH PLANING MACHINE.

Planes 54 inches wide by 54 inches high. Driving shaft parallel with bed, bringing machine in line with overhead shafting. Independent friction feed operated directly from main driving shaft. Horizontal, vertical and angular feed, automatic in either direction, and capable of any variation up to ¾ inch horizontally and ¼ inch vertically. Movement of tool slide upon saddle, 12 inches. Table driven by a powerful train of gearing moving into a rack. First drivers, cut bevels. Quick return motion. High belt velocity. Power elevating motion for cross slide. Belt shifter entirely independent of feed gear, and can be operated from either side of machine by hand. Forward and backward movements by two belts separately shifted. Wearing parts of shifting mechanism protected by hardened steel surfaces. Driving shaft and pulleys put at right angles with bed, if so desired. Countershaft and wrenches included.

Speed of Countershaft, 174 revolutions per minute.

60-INCH PLANING MACHINE.

Planes 60 inches wide by 60 inches high. Other dimensions same as above.

6-FOOT PLANING MACHINE.

Planes 6 feet wide by 6 feet high. Driving shaft parallel with bed, bringing machine in line with overhead shafting. Independent friction feed operated directly from main driving shaft. Horizontal, vertical and angular feed, automatic in either direction, and capable of any variation up to ¾ inch horizontally and ⅝ inch vertically. Movement of tool slide upon saddle, 12½ inches. Table driven by a powerful train of gearing moving into a rack. First drivers, cut bevels. Quick return motion. High belt velocity. Power elevating motion for cross slide. Belt shifter entirely independent of feed gear, and can be operated from either side of machine by hand. Forward and backward movements by two belts separately shifted. Wearing parts of shifting mechanism protected by hardened steel surfaces. Driving shaft and pulleys put at right angles with bed, if so desired. Countershaft and wrenches included.

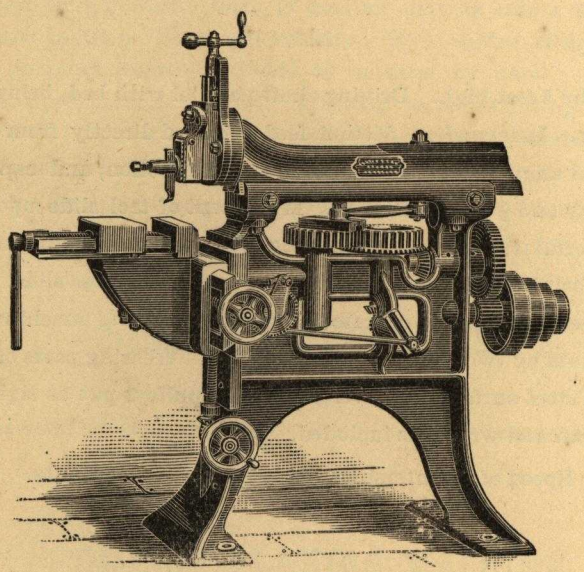
Speed of Countershaft, 205 revolutions per minute.

PRICE LIST OF PLANING MACHINE.

Will plane 30 inches wide, 30 inches high, 8 feet long, weight 10,500 pounds, price	
Will plane 36 inches wide, 36 inches high, 10 feet long, weight 15,200 pounds, price	
Will plane 42 inches wide, 42 inches high, 12 feet long, weight 19,800 pounds, price	
Will plane 48 inches wide, 48 inches high, 12 feet long, weight 22,500 pounds, price	
Will plane 54 inches wide, 54 inches high, 14 feet long, weight 31,050 pounds, price	
Will plane 60 inches wide, 60 inches high, 16 feet long, weight 36,500 pounds, price	
Will plane 72 inches wide, 72 inches high, 20 feet long, weight 75,000 pounds, price	
Price per additional foot of table	
Price for extra Slide Rest on Cross Head	
Price for vertical Slide Rest on Upright	

Boxing extra.

NINE-INCH SHAPING MACHINE.



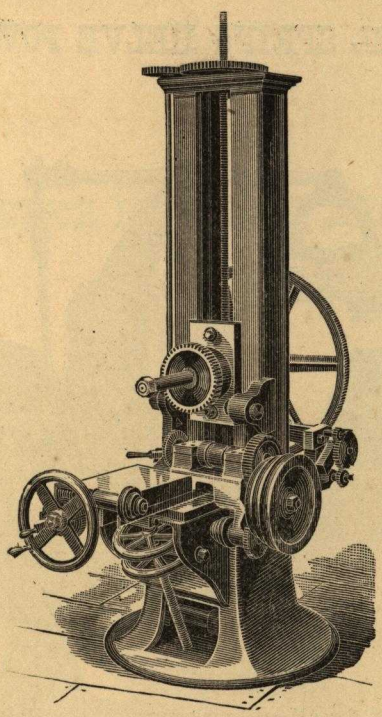
Nine inch stroke; table and vise has cross motion of eighteen inches, and can be elevated or lowered nine inches; tool box has vertical motion of six inches. The return stroke of tool has three times the velocity of forward stroke, this motion being secured by means of a pair of elliptical gears. The stroke may be altered from 0 to nine inches, by means of a slotted crank cast upon elliptical gear. Cross feed is automatic and is changed from fine to coarse by variable crank motion. All screws made of steel; all wearing surfaces broad and scraped to a perfect bearing. Lost motion in cross head and fiddle taken up by means of taper wedges, with screw adjustment.

Speed of countershaft, —. Weight, — pounds.

Price.....

Countershaft and Wrenches included. Boxing extra.

48-INCH GEAR CUTTING MACHINE.



Will cut any gear from one inch to forty-eight inches diameter and twelve inches face. Cutter carriage is swung from fulcrum upon stanchion and can be tilted by means of adjustable screw to cut bevel gears of any required angle. The tool has automatic friction feed with three changes of speed, secured by three shift cone pulleys, also automatic stop motion, so arranged as to give a feed of any required length from 0 to five inches. Worm dividing wheel is laid out with mathematical accuracy by our Standard Dividing Machine and finished by Worm Milling Tool, thus securing great perfection in this vital feature of a Gear Cutter. Screws and spindles all made of hammered steel. All journals large and well fitted, and sliding surfaces broad and scraped to a perfect bearing. A proper complement of change gears to cut large range of pitches furnished with each machine, also countershaft, tightener and full set of wrenches.

Speed of countershaft, — . Weight, — pounds. Boxing extra.

Price.....

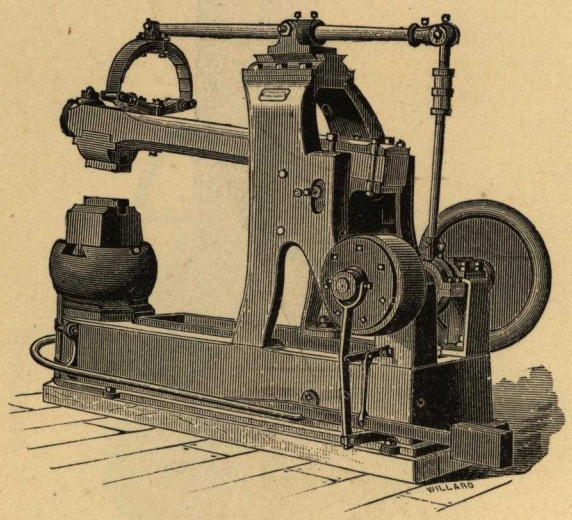
84-INCH GEAR CUTTING MACHINE.

Will cut any gear from one inch to eighty-four inches diameter and ten inches face. Cutter carriage is swung from fulcrum upon stanchion and can be tilted by means of an adjustable screw to cut bevel gears of any required angle. The tool has automatic friction feed, with three changes of speed, secured by three shift cone pulleys, also automatic stop motion, so arranged as to give a feed of any required length, from 0 to ten inches. Worm dividing wheel is laid out with mathematical accuracy by our Standard Dividing Machine and is made in halves. In the process of finishing with the Worm Milling Tool the relative position of the sections to each other is repeatedly changed and the teeth are remilled after each change until all inaccuracies in pitch are eliminated, thus securing the greatest perfection in this vital feature of a Gear Cutter. Screws and spindles all made of hammered steel. All journals large and well fitted, and sliding surfaces broad and scraped to a perfect bearing. A proper complement of change gears to cut large range of pitches furnished with each machine, also countershaft, tightener and full set of wrenches.

Speed of countershaft, — . Weight, — pounds. Boxing extra.

Price.....

PENNEY'S STEEL SPRING HELVE POWER HAMMER.



It is a well-known fact that for all ordinary purposes a Helve Hammer is the best, for the reason that it will stand more abuse and do more work, with less expense for repairs, than any other kind of hammer. This cut represents our new Steel Spring Helve Hammer.

It has a full cast-iron bed with independent anvil block, with slide on top in order to adjust the lower die, directly under the upper die.

The hammer head is cast steel, and is very long, in order to give good support to the helve. The helve is pivoted at back end on centres, which pass through independent slides, with screw to raise or lower the helve to accommodate any kind of dies.

The power is applied to the hammer with eccentric on the shaft connected with the lever on top, which in turn is connected with the helve by a spring and strap.

The great advantage of this hammer over all others of this class, is the arrangement for changing the stroke while the hammer is in motion.

The stroke is made short or long by moving a slide on top of hammer, with lever not shown in cut.

The speed is regulated with a cone-shaped paper friction, fitting into the loose pulley.

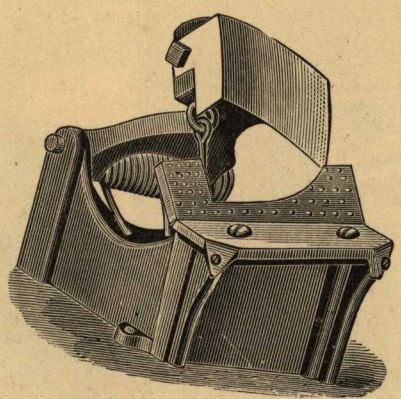
The hammer is made of the best material, is simple, durable and economical.

The hammer has been in use about two years, doing various kinds of work, and is giving good satisfaction.

PRICE OF HAMMER.

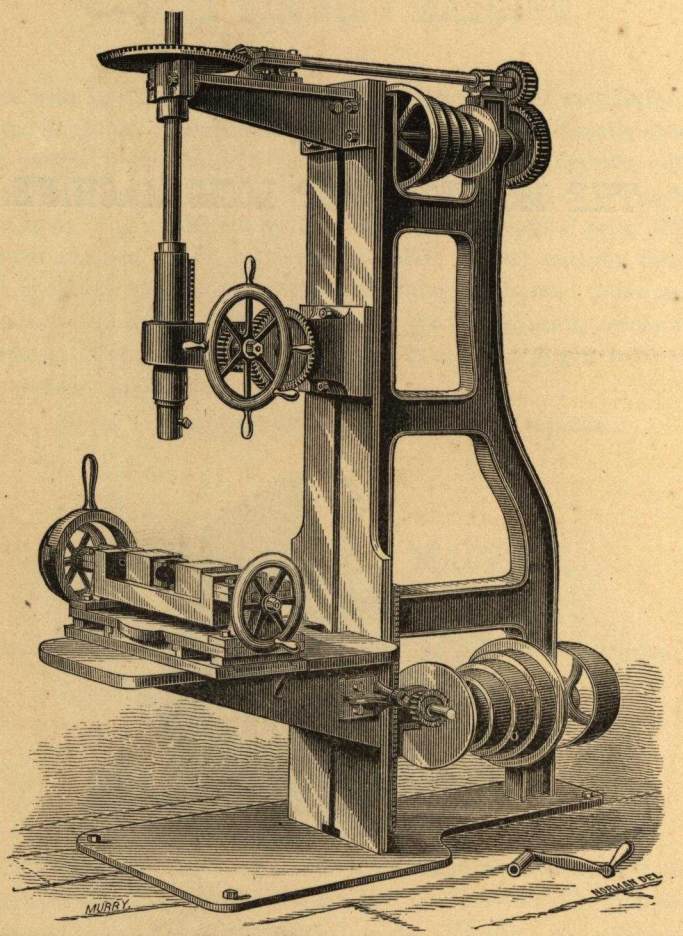
40 pound Hammer	$300 00
60 pound Hammer	400 00
80 pound Hammer	500 00
100 pound Hammer	625 00

THE MONITOR HOOP LOCK MACHINE.



These machines have been in use for several years, and are giving the best of satisfaction, as they are durable, easily worked by the treadle, and doing the work quick and neatly, and seldom needing any repairs. No cooper, making flour barrels, should be without one, as it will save him many times its cost.

MACHINE FOR TAPPING STEAM AND GAS FITTINGS.



The cut above represents a machine which has been designed for general use in the manufacture of Steam and Gas Fittings.

1. It is arranged in regard to speed and power so as to tap fittings for 3 inch pipe, and smaller sizes. It is also well adapted to tapping flanges, branch trees, and all the miscellaneous articles used in Steam and Gas Fitting.

2. As the table can be readily raised or lowered or removed altogether, and there being a large space between the spindle and the frame, very large pieces of work may be placed under the drill, making it an excellent drilling machine for general work.

3. Besides the variation of speed obtained by the cone pulleys, two pair of gear wheels, which are very readily changed, will give almost any desired speed. The frame stands seven feet high, permitting of the pulleys being put far enough apart to allow of a good length of belt, thus avoiding a difficulty common in such machines.

4. The chuck for holding fittings is strong and well fitted, and is provided with a compound movement so as to permit of its self-adjustment to the line of the spindle.

5. The spindle is counter-balanced, and the arrangement for moving it up and down is very convenient, being at the same time powerful and quick in its movement.

6. The attachment to the spindle for reducing the friction on same is very essential to a tapping machine.

We make them of two sizes, and furnish them complete, with countershaft.

SPEEDS OF LOWER CONE SHAFT.

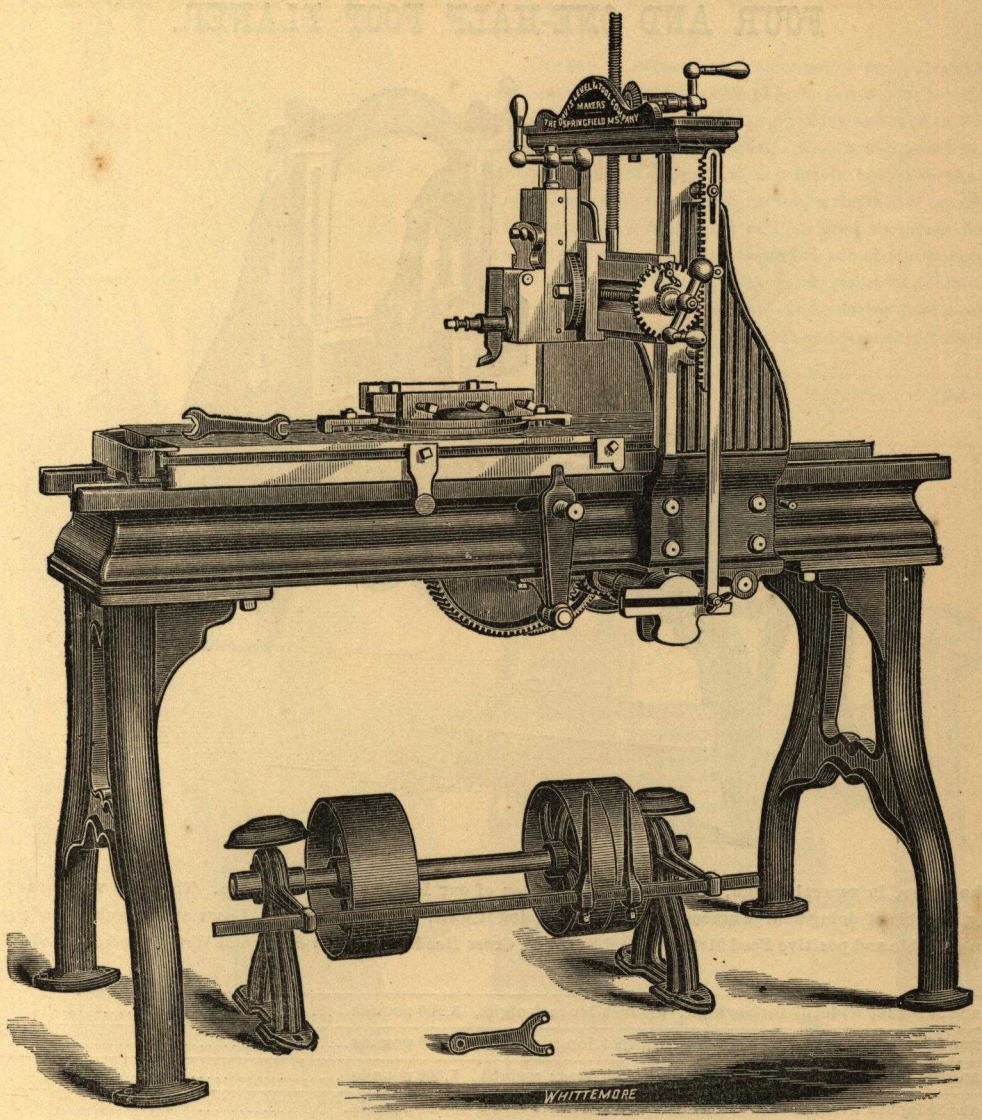
No. 2—150 revolutions per minute. No. 3—200 revolutions per minute, for tapping 1 to 3 inches. No. 3—134 revolutions per minute for tapping 3½ to 8 inches.

Weight of No. 2, 3,000 lbs. Weight of No. 3, 4,000 lbs.

PRICES.

No. 2, tapping 3 inch and smaller sizes	$ 600 00
No. 3, tapping 6 inch and smaller sizes	850 00
No. 3, tapping 8 inch and smaller sizes	1,000 00

POWER PLANER.

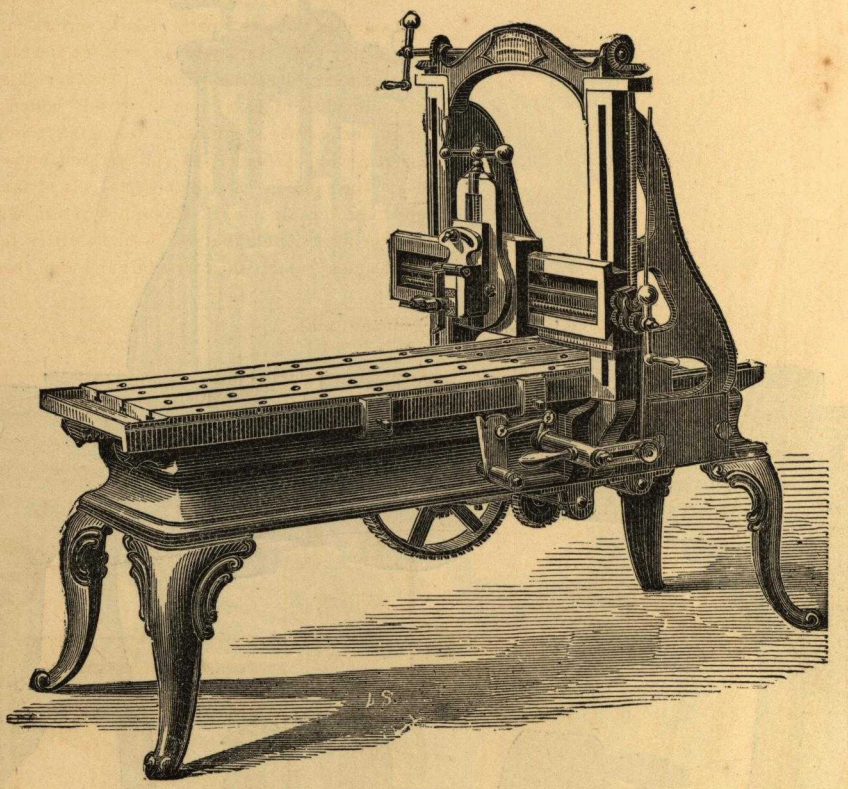


DAVIS' IMPROVED POWER PLANER.

Length of Bed	4 feet 6 inches.
Length of Table	3 feet 6 inches.
Plane's Length	3 feet.
Plane's Height	11 inches.
Plane's Width	16 inches.
Weight	1,000 lbs.
Price	$350 00

The above cut represents our 3-foot Planer, from new and improved patterns. The table has three T Slots for bolt heads, also four rows of holes drilled and reamed. Pockets are cast in each end of the table for holding the tools, wrenches, etc., commonly used about a planer. The compound head is mounted on a broad saddle that slides on the cross head. Its circular base is graduated by degrees of a circle, and can be set accurately at any angle desired. The tool holder can also be set at any angle independent of the head. The cross head is raised or lowered by means of an upright screw and beveled gears. It has V ways planed in each end, fitting corresponding ways on uprights, so that when tightened will always come perfectly true with the table. The gears and racks are cut from blanks. The counter-shaft for this Planer has 275 revolutions per minute.

FOUR AND ONE-HALF FOOT PLANER.



The above, in general design, is a fair representation of our Planers up to 36 inches. They are very heavy and strong, capable of doing a large amount of work, and doing it well. They have Cross, Down and Angular Feed; quick return of Table and positive Feed Motion; Steel Screw in Cross Heads. Counter-Shaft and Wrenches furnished.

To plane 24 inches wide, 17 inches high, 4½ feet long; weight, 3,000 pounds	
To plane 30 inches wide, 24 inches high, 6½ feet long; weight, 4,700 pounds	
To plane 36 inches wide, 30 inches high, 8½ feet long; weight, 7,500 pounds	
To plane 36 inches wide, 36 inches high, 10 feet long; weight, 10,000 pounds	
To plane 48 inches wide, 48 inches high, 13 feet long; weight, 15,000 pounds	
To plane 48 inches wide, 48 inches high, 17 feet long; weight, 20,000 pounds	

COMPOUND PLANER OR SHAPER.

This tool is made from new and improved patterns. It stands on a hollow column; has graduated stroke and quick return; adjustable Automatic Cross Feed. The Slide Bar stands on edge instead of lying down flat, thus adding great strength and rigidity, which prevents springing when tool is running to the limit of its Stroke. The table has both horizontal and vertical surface, slotted for holding work; has 12 inches Stroke, 20 inches Traverse; weight, 2,400 pounds.

Price, with Counter-Shaft, Chucks and Wrenches	

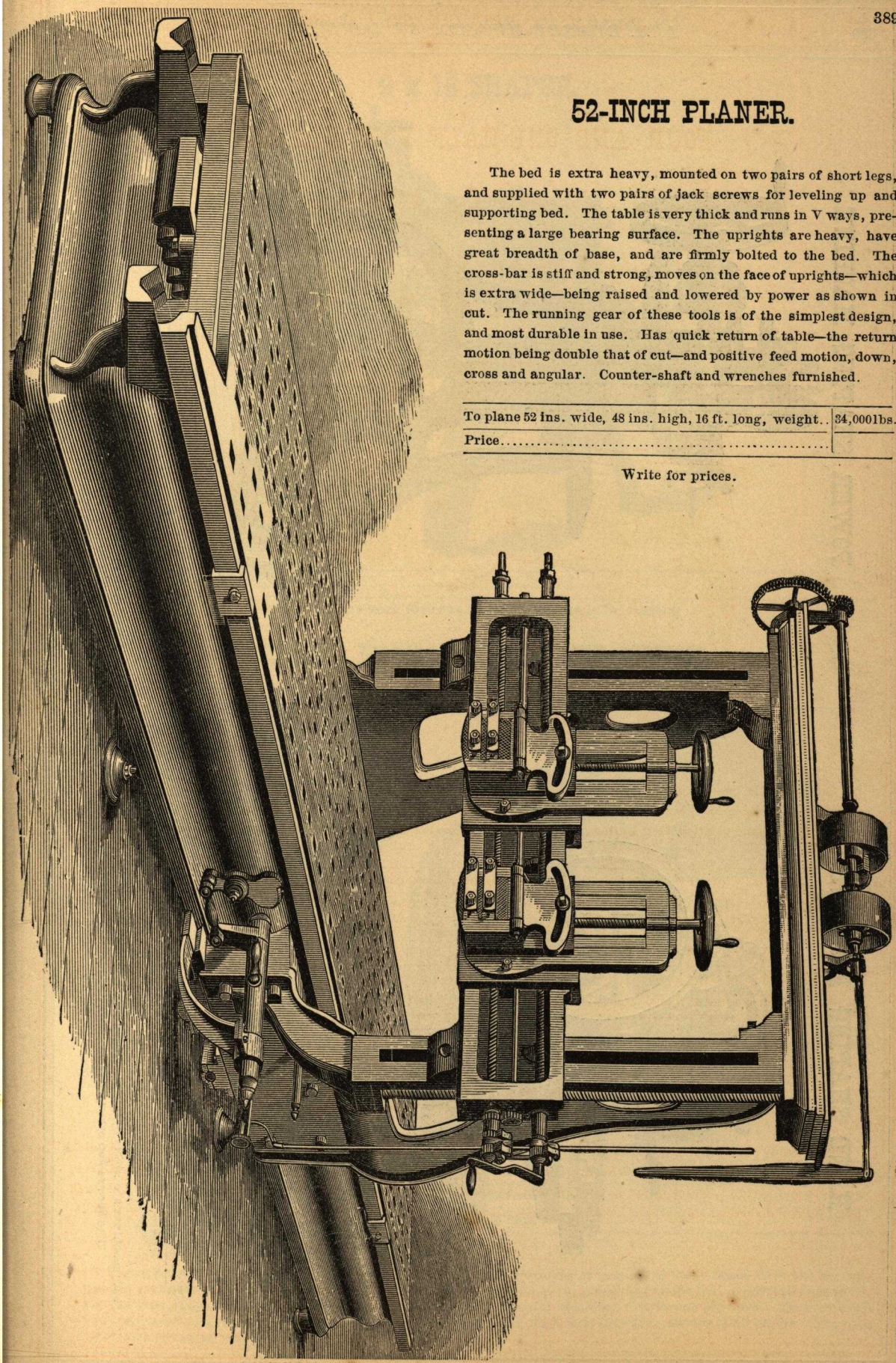
We have no illustration, but will be pleased to furnish photographs of the machine at any time. Write for prices.

52-INCH PLANER.

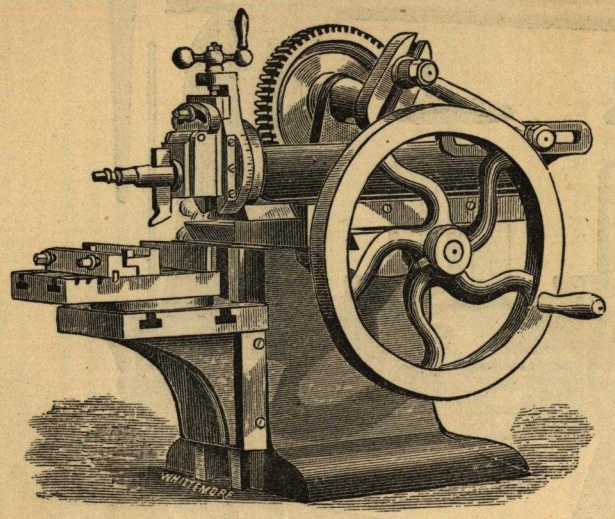
The bed is extra heavy, mounted on two pairs of short legs, and supplied with two pairs of jack screws for leveling up and supporting bed. The table is very thick and runs in V ways, presenting a large bearing surface. The uprights are heavy, have great breadth of base, and are firmly bolted to the bed. The cross-bar is stiff and strong, moves on the face of uprights—which is extra wide—being raised and lowered by power as shown in cut. The running gear of these tools is of the simplest design, and most durable in use. Has quick return of table—the return motion being double that of cut—and positive feed motion, down, cross and angular. Counter-shaft and wrenches furnished.

To plane 52 ins. wide, 48 ins. high, 16 ft. long, weight..	34,000lbs.
Price.....	

Write for prices.



HAND SHAPING MACHINE.



This machine has a stroke of 6 inches, and may be readily adjusted to work any less distance.

Length of Traverse, 8 inches.

Vertical adjustment of Table, 3 inches.

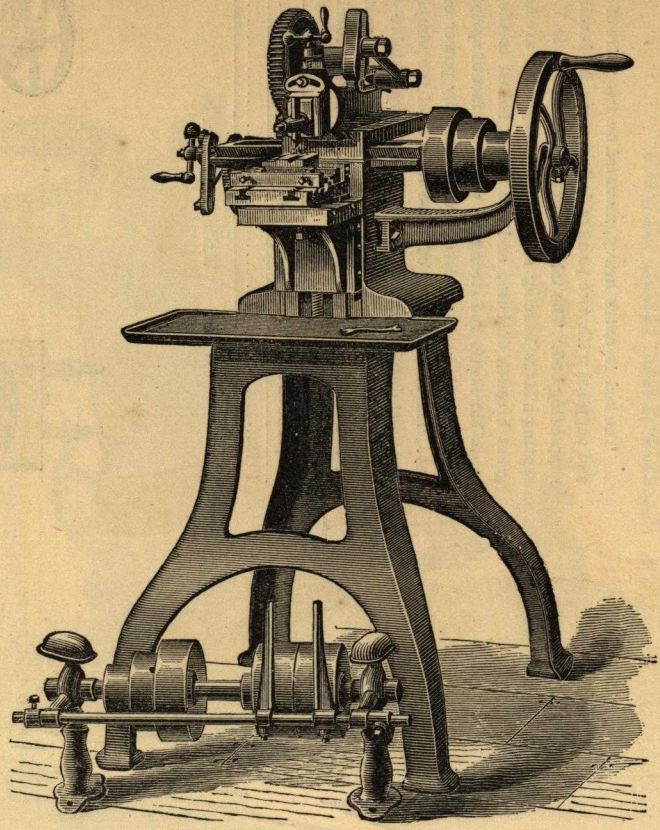
The sliding parts are all well fitted by scraping.

The machine is furnished with the 6-inch Prouty Patent Chuck.

Weight, 250 pounds.

Price	$100 00

POWER SHAPING MACHINE.

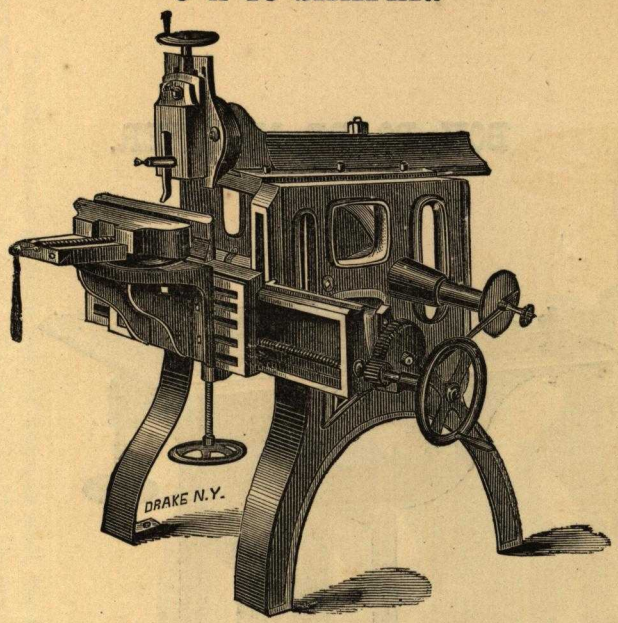


Price, with Counter-Shaft	$125 00

Weight, including Counter-Shaft, 350 lbs. Same dimension as Hand Shaper.

These machines are nicely designed, well made, firm, and will carry a heavy chip. The Packings, Driving Shaft and Feed Screws are of Steel. The sliding parts are all well fitted. The Screws and other parts, where necessary, are case hardened. The Head is indexed for planing bevels, and is a complete machine in all its appointments, and a desirable Tool for Model Makers, Die Sinkers, Railroad Shops, and all other Shops where machine work is done.

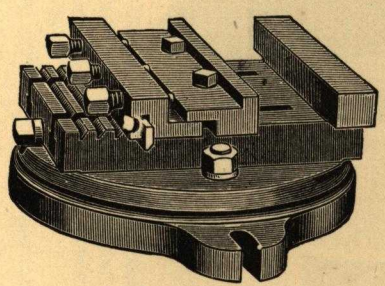
9 x 18 SHAPER.



Price	$350 00

Will do more work than any Shaper of its size in the market.

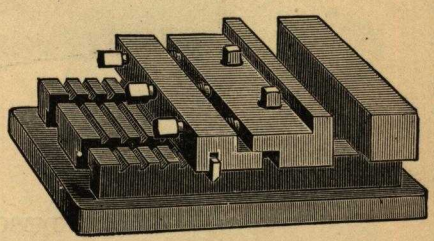
PROUTY IMPROVED PLANER CHUCK.



ROUND SWIVEL BASE.

6 inch jaw	$25 00
8 inch jaw	30 00
10 inch jaw	36 00
12 inch jaw	40 00

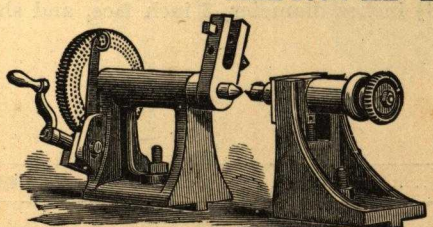
Patented June 29, 1875.



SQUARE BASE.

8 inch jaw	$25 00
10 inch jaw	30 00
12 inch jaw	35 00
15 inch jaw	45 00
18 inch jaw	60 00

IMPROVED PLANER CENTRES.

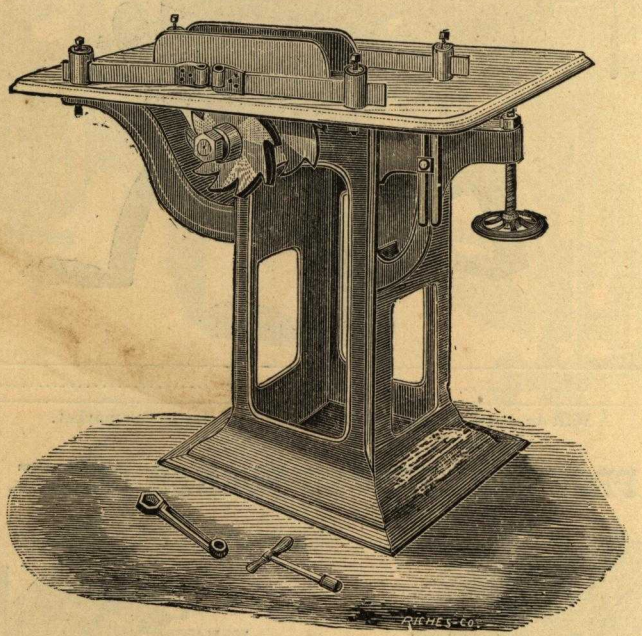


PRICES.

10 inch swing	$40 00
12 inch swing	45 00
16 inch swing	55 00

The improvement claimed is in the device for dropping the worm out of gear, as in many cases it is not needed, thereby saving time. The Dials are so drilled that they are calculated to plane any shape that is generally required, and for fluting taps, reamers, etc. They are made of the best material—Spindles and Screws are Steel. They are built by experienced and careful workmen, and it is said by those using them that they are superior to all others. They are recommended by all machinists who have used them.

BOX BOARD MATCHER.



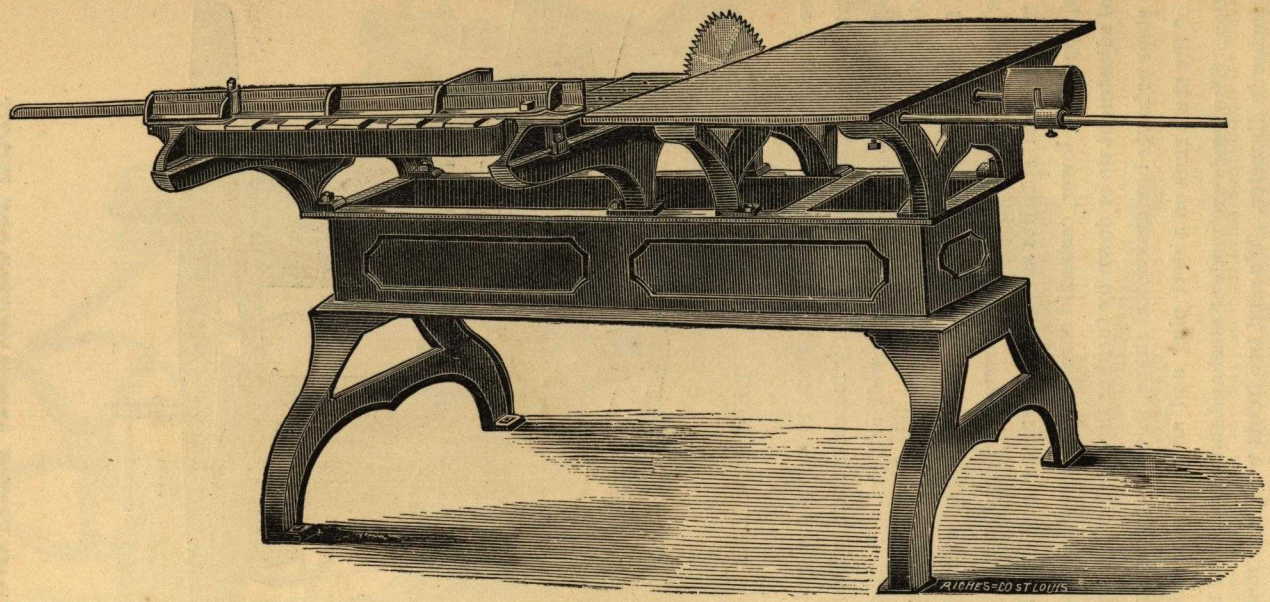
DESCRIPTION.

This Machine is particularly designed to meet the wants of Box Makers, but is suitable for other short work. It is a strong, substantial machine, built entirely of iron and steel, the Frame being in one solid piece. The Table is hinged at one end, the other end has a screw for elevating, and Fastening Wheel for holding it in the position desired.

It has a steel Mandrel carrying two sets of saws, one set making the tongue, the other making the groove. The pulley of the Mandrel is 4½ inches diameter, 5 inch face, and should make 3,000 revolutions per minute.

Price	$85 00

CARRIAGE CUTTING-OFF SAW.



DESCRIPTION.

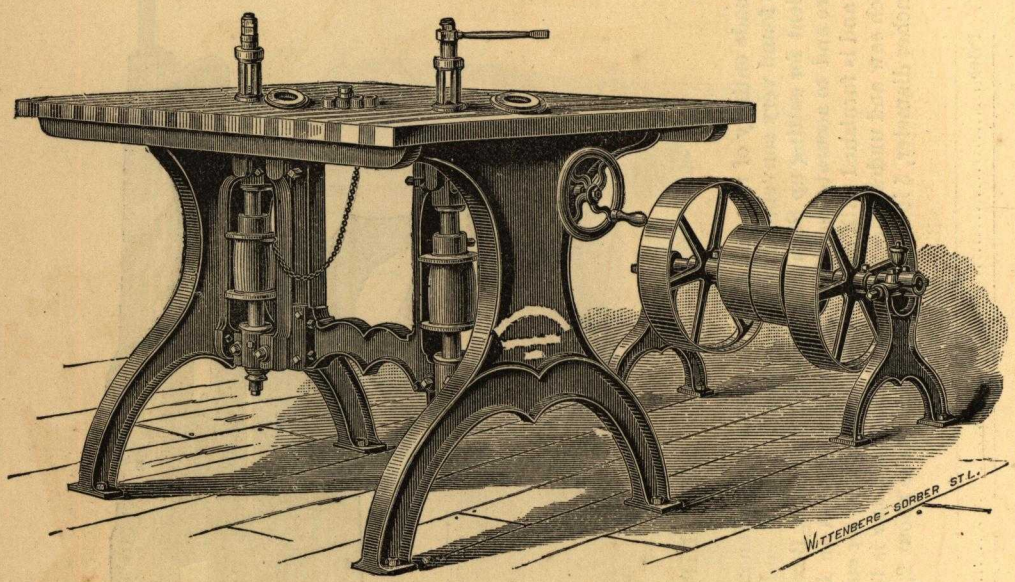
This Machine is made entirely of iron and steel, the frame of the Tenon Machine being used for this purpose. The frame, being narrow and the legs wide apart, will be found very convenient for the operator.

It is very convenient for cutting up Sash and Door Stuff, Panels, Boxes and for Cabinet-makers' use, and for other purposes when the lumber requires to be cut square and to accurate lengths. It is provided with an Iron Carriage, similar to those on Tenon Machine, with hard wood strips across to make it light, and is furnished with all the stops and gauges for cutting stuff to a given length, either square or angular. The Mandrel is suited to receive a 16-inch saw and under; the size of the hole in the saw is $1\frac{1}{8}$ inch.

The pulley is $4\frac{1}{4}$ inches diameter, 5 inch face, and should make about 2,000 revolutions per minute.

Price.....	$125 00

EDGE MOULDING OR SHAPING MACHINE.



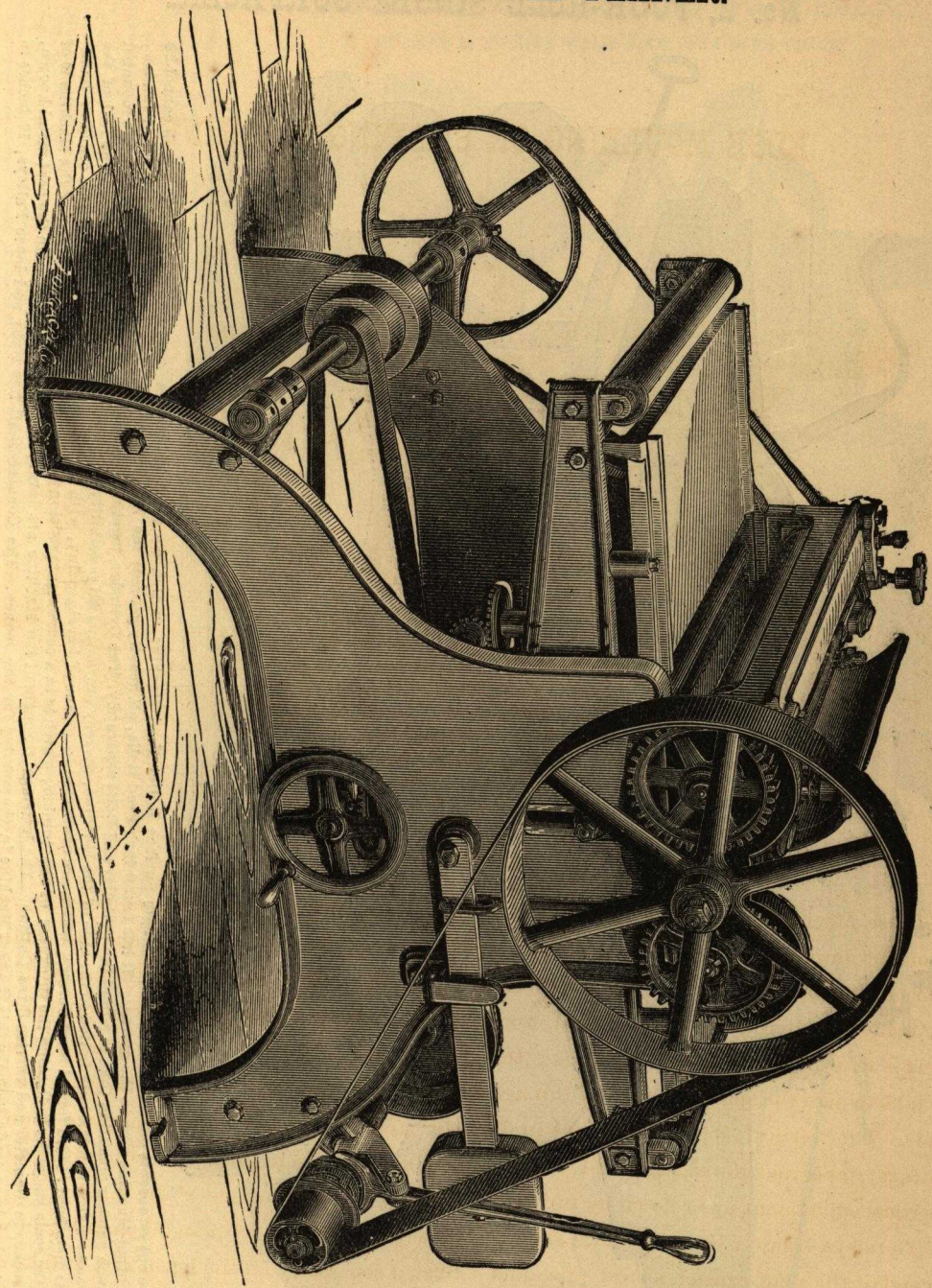
DESCRIPTION.

These Machines have been made from new designs and new patterns, embodying recent important improvements, which greatly increase their efficiency and value, and are suited to perform the heaviest kind of work, as well as light. It has a heavy iron frame, with wood top, made of alternate strips of hard wood, glued to prevent warping or shrinkage. The top is 4 ft. 6 in. by 3 ft. 4 in., 1¾ thick; the spindles are 27 in. apart. It has iron rings let into the table where the spindles come up through and duplicate ring to fit, to close the space for small heads. The vertical spindles are large in diameter and run in headstocks, having connected bearings, upper and lower, cast solid so as to be retained always in line. These headstocks have a vertical adjustment up or down by turning the hand wheels at the side of the table.

The steps or lower box are conical shape, lined with gun metal, with an oil chamber in which the end of the shaft runs on a steel plug and adjusted separately on the headstock to take up all lost motion. The heads are made of steel and independent of the shafts, and can be used from 1⅜ to three inches in diameter. We send two heads with each machine, together with the necessary rings to fill up for different widths of cutters. Each machine is furnished with a counter-shaft, the tight and loose pulleys of which are 10 in. diameter, 4½ in. face, and should make 1,000 revolutions per minute.

Price	$175 00

24-INCH CARRIAGE PLANER.



This Machine is especially adapted to Carriage-makers' use, and, like the Cigar Box Planer, has cylinders forged, with their arbors, out of a solid piece of cast-steel. Great care has been taken to make this Planer the best machine of the kind known, and we will warrant it second to none in the market.

It planes 24 inches wide and 4 inches thick, and will plane smoothly any kind of lumber used by Carriage-builders.

It is constructed with both chip-breaking and pressure bar, which, together with the small cutter-head, secures it against clipping the ends of the stock; planing as thin as the finest veneer, and from that up to 4 inches thick.

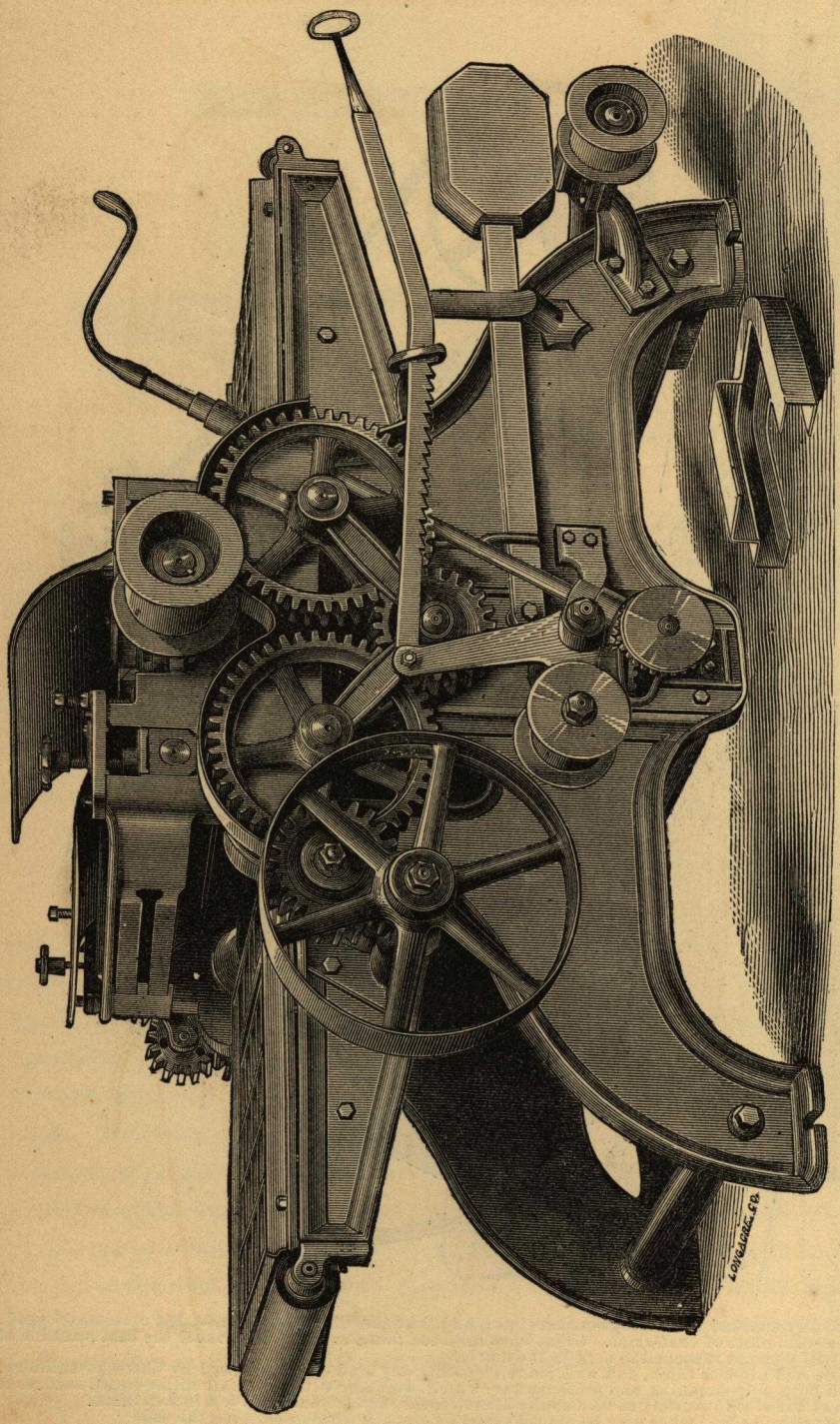
Cut stock and pieces as short as 3¼ inches may be planed perfectly smooth without clipping the ends.

It has three feeds; the slowest will of course be used for the hardest woods, such as Hickory, Ash and Oak. Should run from 4,500 to 5,000 revolutions per minute.

The counter-shaft has tight and loose pulleys, 10 in. diameter and 6 in. face. The driving pulley for cylinder is 20 in. diameter, 4 in. face. The counter-shaft should make from 1,000 to 1,125 revolutions per minute. Belt to drive the counter-shaft should be 5½ in. wide; one cylinder belt, 3¼ in. wide; one feed belt, 1½ in. wide, 7 ft. 9 in. long; one feed belt, 3 in. wide, 8 ft. 9 in. long; and one feed belt, 2 in. wide, 9 ft. 4 in. long. Weight, 1,400 lbs.

Price, without Counter-Shaft	$225 00
Price, with Counter-Shaft	250 00

No. 2, FOUR-ROLL SINGLE SURFACER.



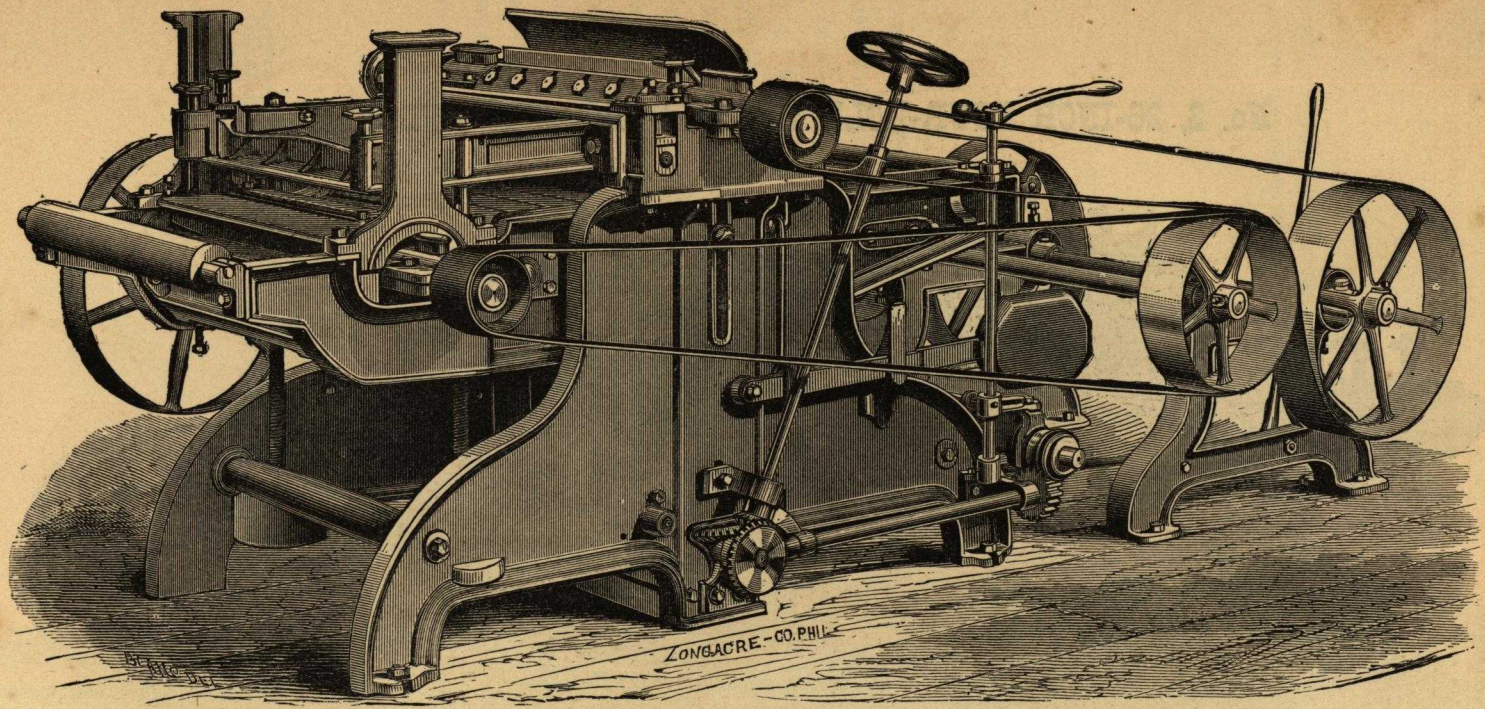
The above cut represents our new and improved Single Surface Roller Feed Machine, which we think contains several points of merit which cannot be found in any other Machine now in the market. It has four 6-inch Feed Rolls, all heavily geared; the Bed lowers and raises to vary the thickness of lumber, which is a much quicker operation than to adjust the Cylinder and Rolls separately. The Cylinder, together with the upper Rolls and Pressure Bar, are mounted in a heavy frame, which is left firmly bolted to the side of the Machine, thereby preventing all possibility of the gearings getting out of line. The Bed of the Machine rests upon heavy solid forged Steel Screws, which are connected by means of bevel gearing, with the incline shaft terminating with a crank or hand-wheel, near the scale gauge for indicating the thickness of the lumber, which is in a convenient position for the operator. The Cylinder of the Machine is of Steel, is six inches in diameter and carries three Cutters. The bearings throughout the Machine are large, the boxes are lined with the best metal known, and every effort has been made to make this the best Machine in the country for the money. The Counter-Shaft has tight and loose Pulleys, 12 inches in diameter, 8 inches in face, and should make 900 revolutions per minute.

Belting required: Two 4-in. Belt for Cylinder, one Feed Belt, 3 inches wide, 11 feet long; one Feed Belt, 2 inches wide, 10 ft. long.

Price to Single Surfacer, 26 inches wide, 6 inches thick; weight, 3,500 lbs	$450 00
Price to Single Surfacer, 26 inches wide, 6 inches thick, Tongue and Groove 14 inches wide; weight, 4,000 lbs	650 00
Price to Double Surfacer, 26 inches wide, 6 inches thick; weight, 4,000 lbs	650 00
Price to Double Surfacer, 26 inches wide, 6 inches thick, Tongue and Groove 14 inches wide; weight, 4,500 lbs	850 00

ENDLESS BED DOUBLE SURFACER,

PLANES 26 INCHES WIDE AND 10 INCHES THICK.



Price, complete..... $800 00

Weight of Machine, 5,000 lbs.

DESCRIPTION.

This illustration represents our heavy improved Endless Bed Double Surfacing Machine, which has been recently constructed, from entirely new drawings, for the express purpose of remedying, if possible, every defect heretofore known to exist, in this class of machines; and after the most thorough and rigid tests, we are satisfied that we have accomplished our object. It has been a well-known fact for a long time, with nearly all mill-men, that, Endless Bed Planers, when properly constructed, are the strongest and fastest feeding Machine known, and, considering the first cost, the most economical for the user.

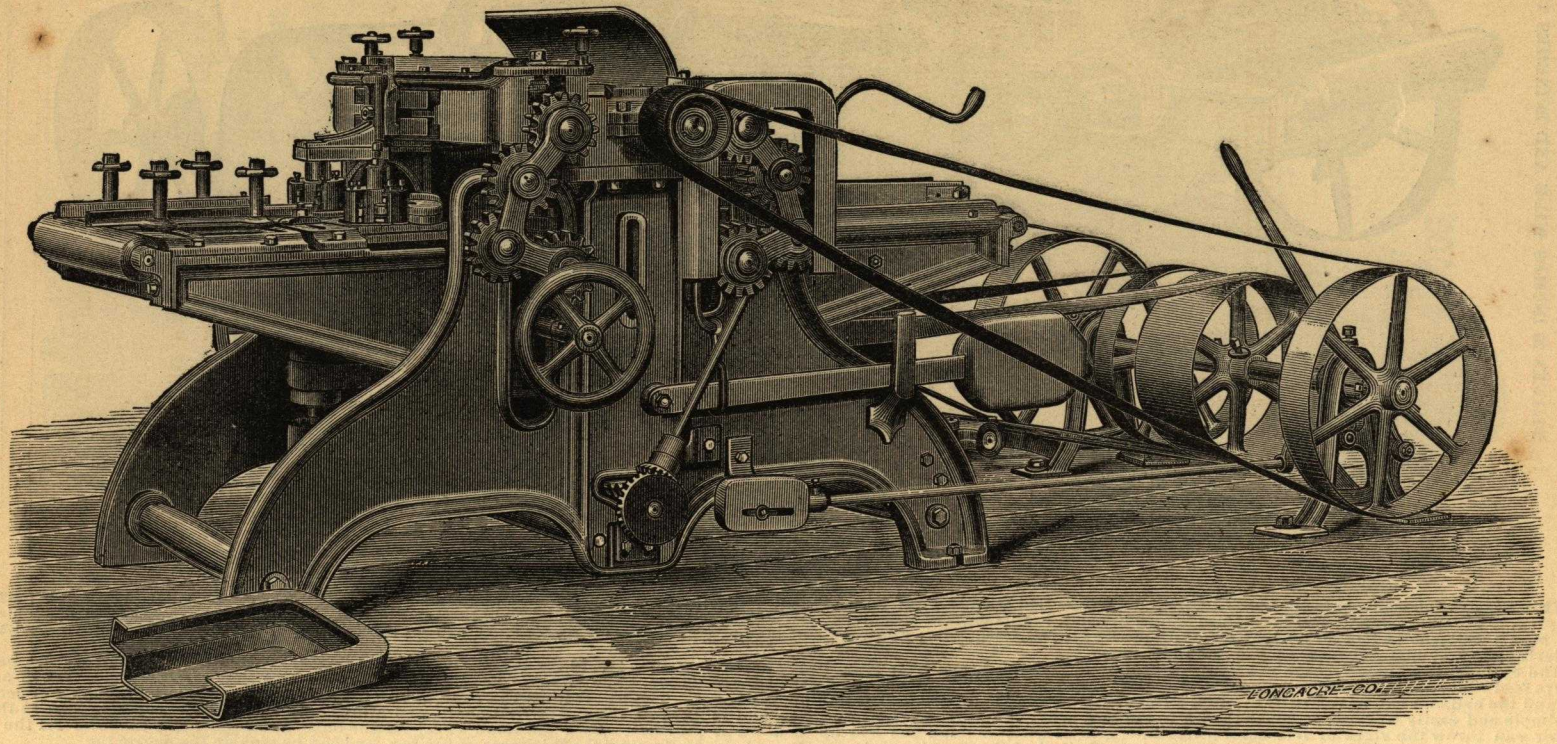
The cylinders in this Machine are both made of steel (entirely), and have long, heavy bearings, which run in the best Babbitt metal boxes. The upper cylinder pressure bar, and pressure feed rolls, are all mounted in one heavy casting, which is firmly bolted to the sides of the Machine. The boxes of the lower cylinder are also tied together, by means of a heavy yoke, and the cylinder can be raised or lowered without the possibility of twisting or binding the boxes. The bed is lowered or raised either by hand or power. The power arrangement is very simple and easily worked; it consists of a worm and gear; the worm is right and left, and is fixed on the end of feed shaft, and allowed to work endwise on a spline, so that the operator can throw the right or left hand worm into gear at will; moving the bed up or down at pleasure. Both the hand wheel for the hand movement, and the lever for the power movement, are conveniently arranged, as they are above the bed of the Machine and near the scale for indicating the thickness of lumber, and can be seen on the engraving.

The plats of the traveling bed are very heavy, and are connected by means of the butt-hinge joint, the centre of which is under the centre or opening between the plats. This carries the plats away from the lumber as it turns down, over the carrying wheel, at the end of the bed, and cannot raise or even press against the under side of lumber so as to interfere with the work of the lower cylinder. When this style of joint is used, there are only one-half the number of joints in the whole bed that are used with the wrought iron links.

There are four self-oiling ways on which the bed travels, two at the extreme end of the plats and two in the middle. The combined width of the four ways are 12 inches, and they are not liable to wear or get out of order. The lower cylinder can be got at to adjust, or sharpen the cutters, by simply lifting out the front roll, one piece of the adjustable bed, and turning back the pressure bar. The whole can be done in less than one-half minute, and the cylinder as handy to come at as it would be on bench.

Belting required for this Machine: Two upper cylinder belts, 4½ inches wide, 17 feet 6 inches long; one under cylinder belt, 4½ inches wide, 16 feet 6 inches long; one tightener belt, 3 inches wide, 14 feet 2 inches long; one feed belt, 2 inches wide, 10 feet 4 inches long.

No. 2, 26-INCH FOUR-ROLL SINGLE SURFACER AND MATCHER.



WEIGHT, 4,000 POUNDS.

No. 2, 26-INCH FOUR-ROLL SINGLE SURFACER AND MATCHER.

The illustration on opposite page represents our No. 2 as a single Surfacer and Matcher. It is of entirely new design, and has been received with so much favor by those having it in use that we feel justified in recommending it very highly to those wanting a medium-sized Machine. It is of the same general construction as the one described on page 396 and 397, with the addition of the side-heads. This Machine is made of the best material, the steel being made especially for us. The matcher-spindles are so arranged that by removing the matcher-head and one bolt they can swing under the Machine, thus changing it to a Single Surfacer. It will match 14 inches wide, and will plane 26 inches wide and 6 inches thick, when the matcher-spindles are turned down. The thickness can be changed, by turning the crank on the inclined shaft, without stopping the Machine. The cylinder has beading cutters, which can be used or removed at pleasure. The planer has Pressure Bars, Matcher-clips, scale for measurement, and all facilities for quick and easy adjustment; takes but little room, and is not liable to get out of order. The counter-shaft has tight and loose pulleys, 12 inches diameter and 8 inches face, and should make 950 revolutions per minute. The centre of counter-shaft should be 6 feet from centre of Machine.

PRICE OF No. 2.

To Surface 26 inches wide, 6 inches thick, Tongue and Groove 14 inches wide	

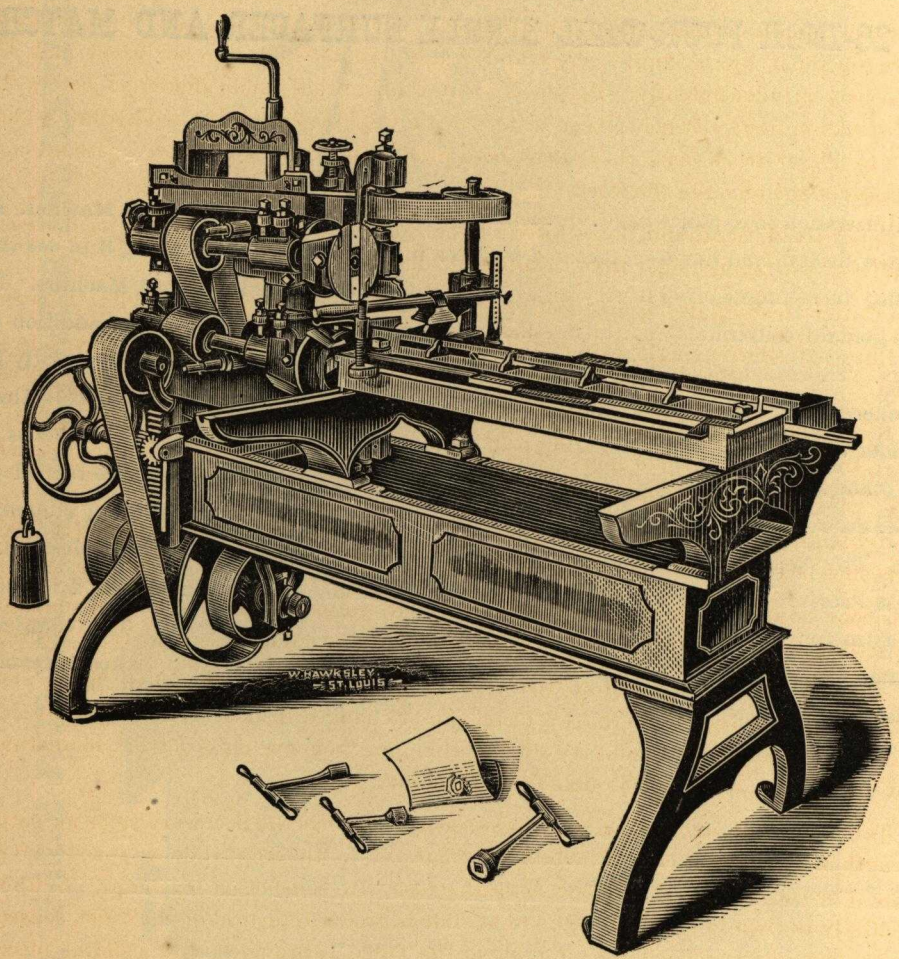
Weight, 4,000 Pounds.

Belting required: Two cylinder belts, 4 inches wide, 16 feet 6 inches long each; two matcher belts, 3 inches wide, 17 feet 10 inches long; one tightener feed belt, 3 inches wide, 12 feet 6 inches long; one feed belt, from cylinder, 2 inches wide, 9 feet 10 inches long.

Write for prices.

IMPROVED TENON MACHINE.

Patented August 17th, 1880.



PRICES.

Double Heads and two Copes	$238 00
Double Heads and no Cope	215 00
Single Head and two Copes	223 00
Single Head and one Cope	215 00
Single Head and no Cope	200 00
Cut-off Saw Attachment, Extra	15 00

DESCRIPTION OF IMPROVED TENON MACHINE.

The machine here illustrated is from new designs, and, with several very important improvements, it is intended for the heaviest door or other work, cutting a tenon 6½ inches long at one cut. It is built entirely of iron and steel, very strong and substantial, yet not cumbersome in working, but is easily handled, and for convenience of adjustment is unsurpassed.

The Steel Spindles, which carry the heads, work in long Babbitted boxes. The upper and lower heads are operated by a single screw and crank handle, and can be raised and lowered simultaneously or independently. By placing the crank on the pinion shafts, projecting through the head stocks in front, either head can be raised or lowered separately; then by simply changing the crank to the screw, as shown in the cut, both heads can be raised or lowered without changing the thickness of the tenon in the least.

The upper Head, Shaft and Boxes have a lateral movement over the lower head, so as to cut one shoulder of the tenon longer than the other, if desired.

Each Cutter-Head Shaft has an effective arrangement which prevents all vibrations endwise.

The Cutter-Heads are single, to cut 3½ inches in length, or double to cut 6½ inches in length, as ordered.

The Knives are formed to have a drawing cut, whereby they cut easily and smoothly. Saws are used in the Heads, instead of spurs. The Driving Pulleys are wide and are placed between the boxes, and the belt runs with perfect clearance.

The tightening arrangement is complete. It is operated by a weight and pulley, and when the belt is once laced, it needs no further attention.

Each cope is attached to the head-stock in which the cutter-shaft revolves, and needs no separate setting, while they are arranged so that they can be adjusted separately, if desired.

The Cope-Heads are fastened to the shaft with a set-screw, the shaft being slotted to receive the point of the screw, so that the heads can be changed instead of changing cutters, which will be found very convenient and save time in changing from one class of work to another. We send four Cope Heads with each Double Cope Machine.

The Table is light and strong, and slides easily. It has the necessary stops for getting the exact length of tenon to be cut. The table is clamped to the front slide, so that by no possible means can it be thrown into the Heads, as is the case with some other machines. Neither can it be accidentally thrown to the floor. The front slide is grooved, instead of the table, consequently not so liable to work dry. The fence, or guide to the Table, is provided with a sliding piece, which can be fastened at any point, so that the piece to be cut shall have a firm bearing at each end.

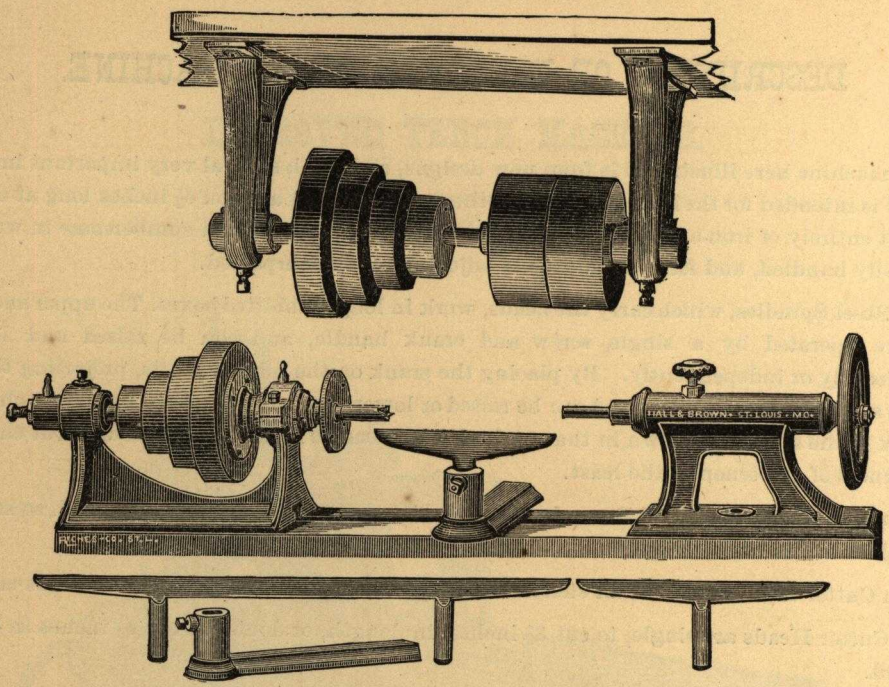
The attached counter-shaft is large size, and carries tight and loose pulleys, ten inches in diameter, and four and-a-half inch face, and should make 800 or 900 revolutions per minute.

The Machine is adapted to all classes of work where a Medium Size Machine is needed, such as Sash, Doors, Cabinet and Agricultural work, etc. The Machine, as shown here, is arranged with Double Copes for Doors.

We guarantee this Machine to give entire satisfaction, in every case.

Weight, about one thousand pounds.

WOOD TURNING LATHES.

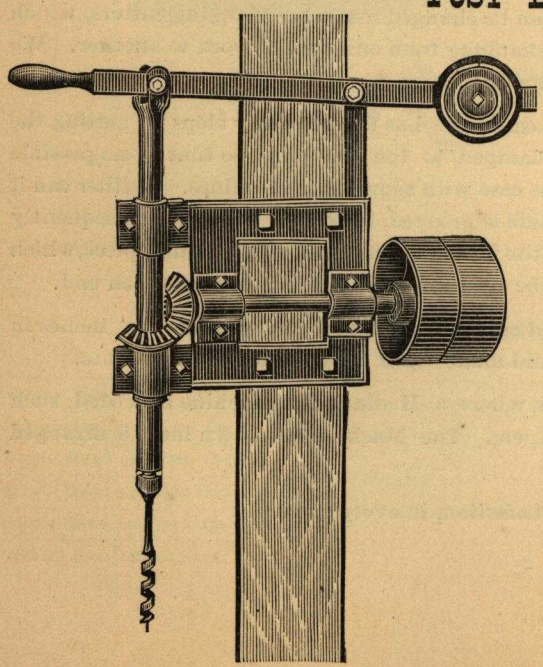


These Lathes are made with great care, from new patterns, and of the very best material; are nicely balanced and have steel spindles. The Lathe consists of Head and Tail Blocks, Counter-Shaft, Haugers and Pulleys, Face Plate, Spur and Female Centres, two Rest Sockets, one Double and two T Rests. We also make them for Pattern-makers' use, with Cone Pulley reversed from that on the common Turning Lathe, for the greater convenience of performing many kinds of work, which has left-hand thread at rear end of spindle, with an additional Face Plate to fit, for turning large diameters. We can also furnish a Floor Rest, if desired, which can be readily adjusted to the required work. We are now building four sizes:

12-inch swing	$50 00	16-inch swing	$70 00
14-inch swing	60 00	18-inch swing	80 00

For Pattern-makers' use, with Floor Rest, $15 00 extra.

POST BORER.

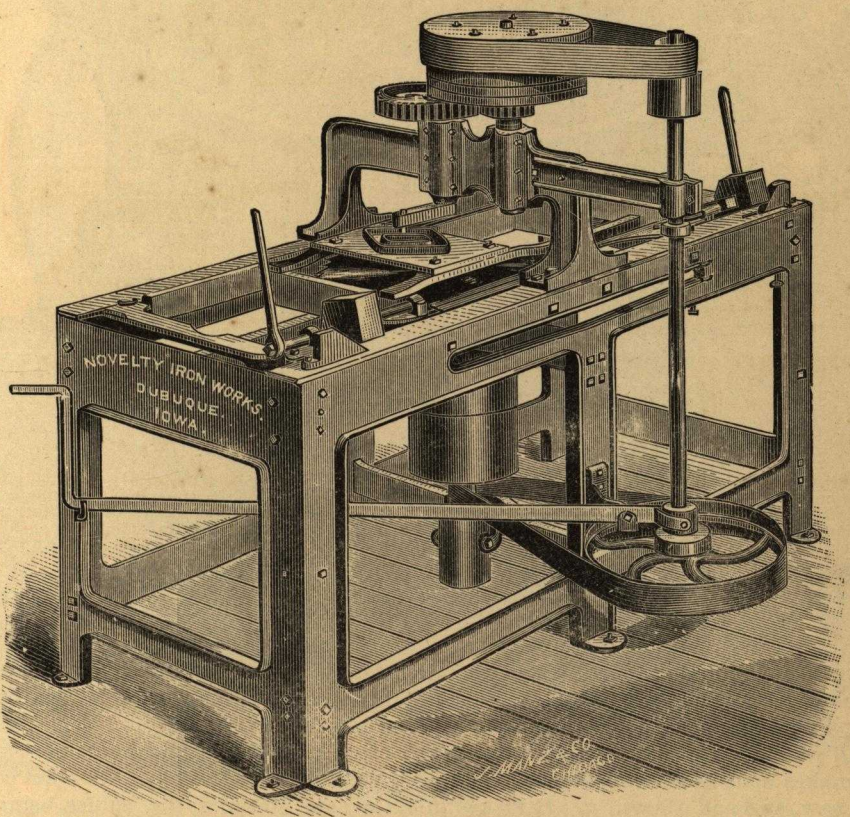


DESCRIPTION.

This low-priced Borer will be found very convenient in all Wood Working establishments where a Borer is needed. It can be easily attached to any post. The pulleys are 8 inches in diameter and 3½ in face, and should make eight or nine hundred revolutions per minute.

Price	$25 00

BURT'S TWO-BLOCK SHINGLE MACHINE.

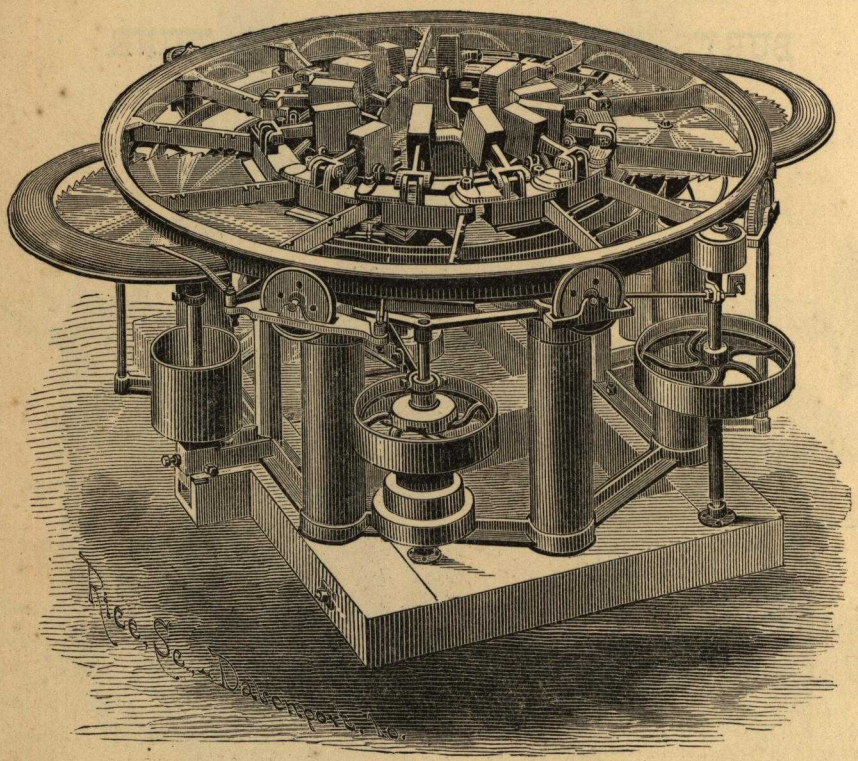


This machine is offered to supply the demand for a machine having a capacity greater than hand machines, and not so large as our 12-block. It will make as many shingles as any two-block mill built, and its great superiority over all others is its simplicity, and we have nothing that is liable to give trouble or expense. The Crank and Diamond Groove is all there is to give the motion to the carriages. It is very strong and durable.

PRICE.

With 2 Saws and Collars	$550 00

EVARTS' PATENT ROTARY 12-BLOCK SHINGLE MACHINE.



The above cut represents our 12-Block Shingle Machine, with late improvements made this year, and now acknowledged the best Large Shingle Machine in the world. It has been in use for the last ten years, and in every instance has given satisfaction.

We will state a few points wherein it excels any other kind of Shingle Machine:

1. It makes smoother work, because the feed is uniform, and the block does not come back across the saw, as do all others. 2. It makes much evener Shingles, the Tables being fixed in opposite directions and not tilted. If the Blocks vary in length the Shingles do not vary in thickness. 3. It will saw double the quantity that any two-block machine can in the same time, and four times as many as any one block machine. 4. It makes fewer clip shingles than any other machine. 5. One man is sufficient to tend the machine—put in the bolts and remove the spalts—thus doing what with other machines requires the labor of three or four men.

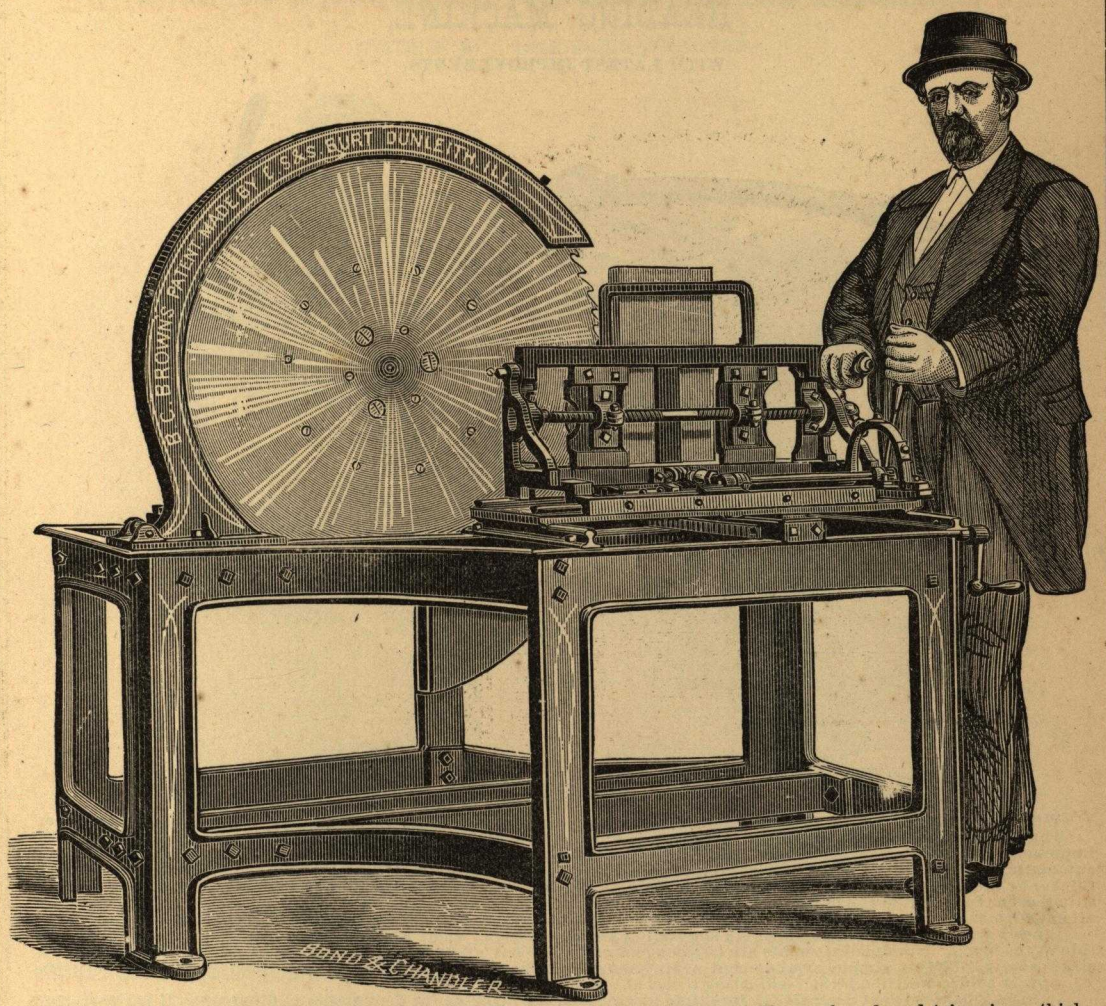
Finally, this machine being mainly constructed of iron and steel, it is almost indestructible, and from its simplicity not liable to get out of order. After the blocks are prepared, the only labor is to place them in the carriage and remove the spalts or slab. It saws the blocks up as close as any other machine, leaving very small slabs or spalts, and takes in as large size block as any, and the blocks being undogged (except when passing over the saw) can be taken out and turned or replaced by a new one without loss of time or danger to the tender. There is not a gear or spring in this machine to get out of order. With two saws this machine will cut, in ordinary white pine or cypress timber, 150,000 shingles per day. A 30-horse power engine will run this machine, Drag Saw, Jointer, Bolter, etc.

PRICES.

Evarts' Patent 12-Block Rotary Shingle Machine, 2 saws and 2 extra saws	$1,250 00
Countershafts, Brackets, Pulleys, Tighteners and Belts	300 00

Size of Pulleys, 12 inches in diameter by 12 inch face. Shipping weight of machine alone, 5,000 pounds. We set up this machine at above price, by payment of traveling expenses.

B. C. BROWN'S PATENT SPALT AND SHINGLE MACHINE.



The necessity for a machine that would utilize the enormous waste of saw mills—such as board trimmings, thick slabs, log buttings and waste from shingle machines—has long been felt by manufacturers of lumber. Machines for this purpose have been invented from time to time, but when put to test invariably found to be slow of operation and complicated, so much so as to be impracticable and of no use as a shingle machine. In this machine, invented and patented by B. C. Brown, is combined with the Spalt all the requisites of a first-class Shingle Machine, with a capacity from 20,000 to 25,000 shingles per day from ordinary shingle bolts, and from 8,000 to 12,000 shingles per day from spalts, board trimmings, slabs and mill waste generally. Absolutely nothing need be lost fit for shingles except the saw-kerf, and that is comparatively little, as saws of No. 16 and 17 gauge are used.

The waste material of saw mills, usually burned up, thrown away or sold for firewood, can, with this machine, at slight cost, be made into shingles, thereby saving a large percentage of lumber heretofore a total loss. The product of a few days' labor on this, what is usually termed worthless trash, will pay for a machine. A little investigation and calculation will convince any one of the great utility and saving in the use of this machine.

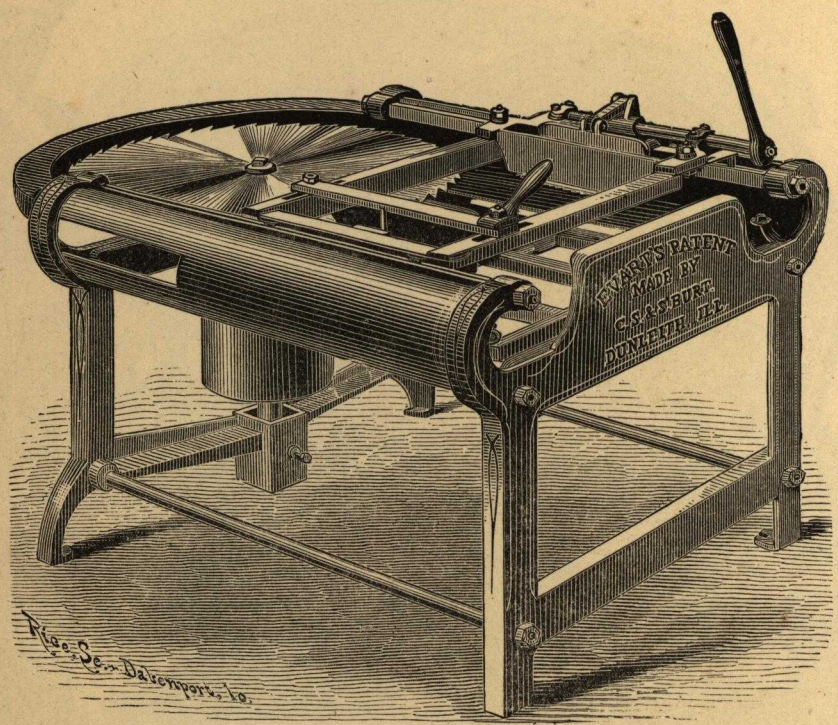
Any thickness of small boards can be made very rapidly on this machine, for tub and pail bottoms, box stuff, looking glass and picture frame backs, headings, etc. By the use of saws of different sizes, shingles in lengths from 16 to 24 inches can be made. The practicability of this machine is no experiment, its value for the purposes intended, having been fully demonstrated as shown by the testimonials we have, which tell more fully its advantages than anything we could possibly say.

PRICES.

Iron Frame, one 36-inch Saw	$300 00
Iron Frame, one 38-inch Saw	310 00
Iron Frame, one 40-inch Saw	320 00
Extra 36-inch Saw and Collar	50 00
Extra 38-inch Saw and Collar	60 00
Extra 40-inch Saw and Collar	70 00

EVARTS' PATENT ONE-BLOCK HAND-FEED SHINGLE AND HEADING MACHINE,

WITH LATEST IMPROVEMENTS.



With our new Spalt or Slab Sawing Improvement we can saw up closer and waste less stock than any other machine.

The above cut represents the original Evarts Patent One-Block Hand-Feed Shingle and Heading Machine, with improvements, which consist in part of grooved slide rods, carriage and taper works. The tapering works are automatic, leaving both hands of the operator free to work the machine. It is so arranged that the shingle can be made thicker or thinner without altering the taper, or both thickness and taper can be changed at will. Also, one or more shingles can be cut from the block without change of taper; by this the bolt can always be kept true and the shingles all cut with the grain of the wood. This is done without the slightest delay or extra labor of the operator.

It has an advantage over others in its adaptation to the sawing of tight barrel heading, thick at the sap edge and thin at the heart. These adjustments are independent of and do not affect the saw, which is secured to the arbor by a single screw. By this simple arrangement a few moments suffice to remove the saw for filing or any other purpose. The saw is held in position by self-adjusting boxes at top and bottom.

In cases where it is not desirable to lose time by stopping the machine for the purpose of filing, etc., it is found very satisfactory to have two or more saws fitted to the machine; while one is in use another is being put in order for use.

This machine needs always a counter or upright shaft, and idler pulley to hold up the belt, which runs on a quarter twist. By a recent improvement we have reduced the weight of the bolt carriage about one-half, and increased the motion of the movable dog, thereby allowing for difference in length of bolts. As now constructed this machine is regarded as the best One-Block Hand-Feed Shingle and Heading Machine in use. It has had the test of years, and has never failed of giving satisfaction when fairly tested. It is still growing in favor as it becomes known to manufacturers, on account of its substantial make, quantity and quality of work and facility of operation. Length and width of shingles or heading made on this machine depends on the size of saw, and varying from one inch to fifteen inches, and in thickness from one-eighth to one-and-a-half inches, and length from four inches to thirty inches.

The working capacity of this machine, in green white pine and cypress, is from 30,000 to 40,000 shingles per day; in yellow pine, 15,000 to 18,000; oak heading, from 8,000 to 12,000 pieces. Variations from the foregoing figures may occur from circumstances not due to the machine.

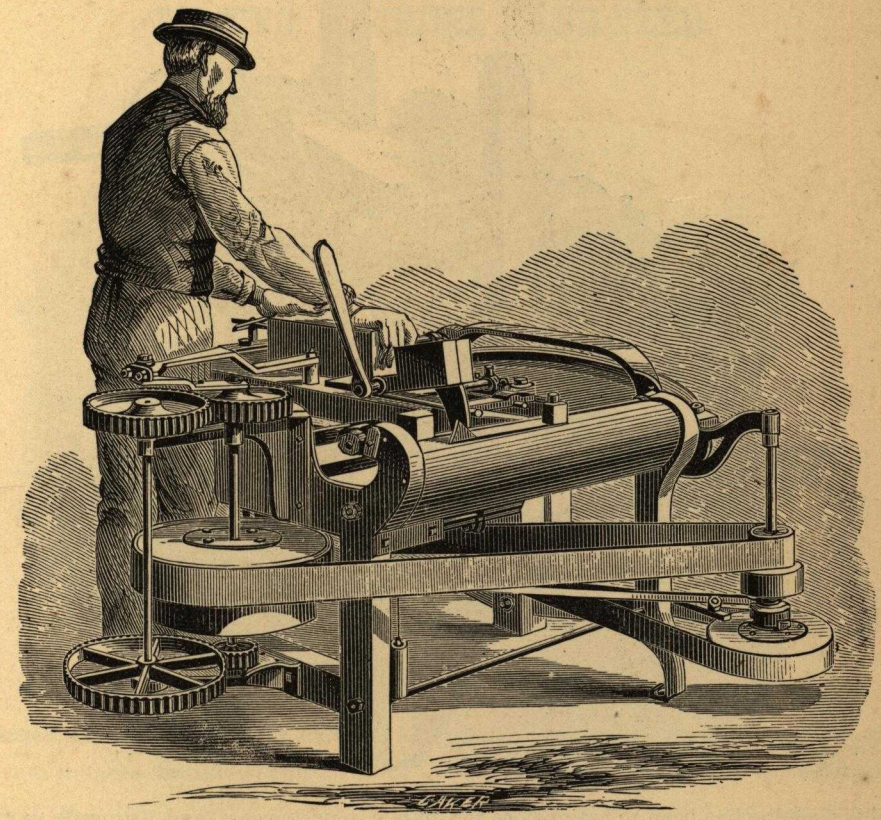
PRICES.

Evarts' Patent Hand-Feed Shingle Machine—one 36 inch saw	$260 00
Extra 36 inch saw and collar	55 00
Evarts' Patent Hand-Feed Shingle and Heading Machine—40 inch saw	280 00
Extra 40 inch saw and collar	65 00
Evarts' Patent Hand-Feed Heading Machine—one 42 inch saw	300 00
Extra 42 inch saw and collar	75 00
Evarts' Patent Hand-Feed Heading Machine—one 44 inch saw	325 00
Extra 44 inch saw and collar	85 00
Evarts' Patent Hand-Feed Heading Machine—one 46 inch saw	340 00
Evarts' Patent Hand-Feed Heading Machine—one 48 inch saw	360 00
Countershaft, tight and loose pulleys and boxes	50 00
Countershaft, tight and loose pulleys and hangers	70 00
Idler pulley, shaft and boxes	15 00

Size of pulley, 12 inches diameter, 9½ inch face. Shipping weight of machine, boxed, 1,100 to 1,200 lbs. Machines for sawing oak heading, fitted with heavy fly-wheel, at above prices. Machines for 46 inch and 48 inch saws made to order. Speed of saw from 1,200 to 1,600 revolutions per minute, according to size of saw.

EVARTS' PATENT ONE-BLOCK SHINGLE MACHINE,

WITH BURT'S SELF-FEED ATTACHED.



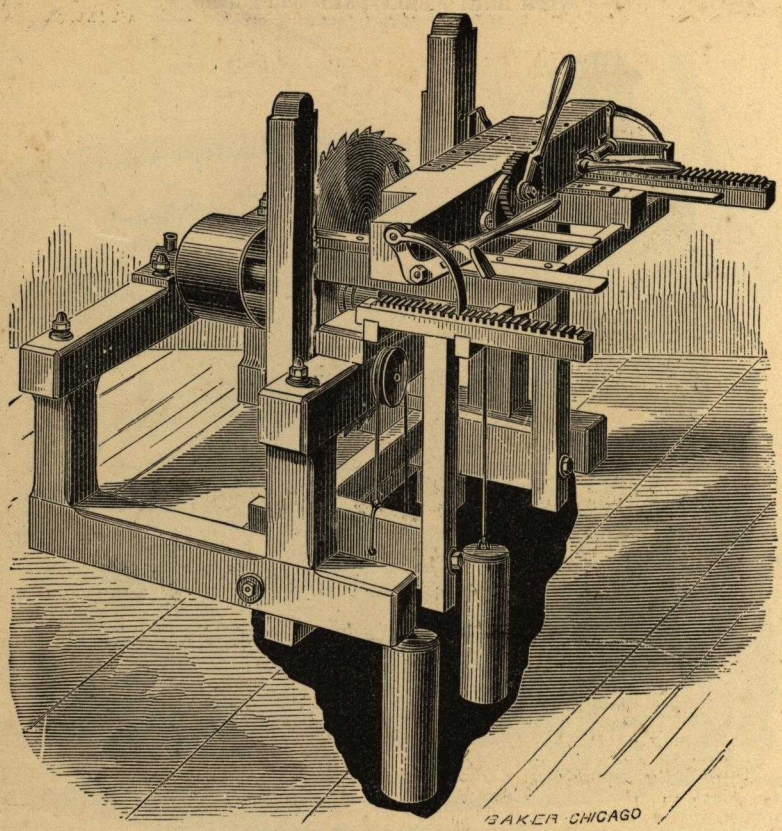
The increasing demand for Self-Feed Shingle Machines induced us to attach the Evarts Hand-Feed Machine Self-Feed Works, which has been done with great success, and we offer this machine as the best single block Automatic Shingle Machine now in use. By the use of eccentric gear the backward movement of the carriage is greatly increased over the feed motion, producing same results as by hand-feed. It is also a combined machine, being in every respect like the Evarts Hand-Feed, except our self-feed attachment, which can be removed in two minutes' time, leaving a perfect hand-feed machine. This arrangement gives a double value to the machine, with very small additional cost, making it really one of the most desirable shingle machines ever offered to the trade. Its capacity is from 18,000 to 22,000 shingles per day. Length of shingle not over 18 inches. To change from self-feed to hand-feed, remove the pitman and dog weight, and change the connection between the dog and lever shaft from the bottom to the top by using an extra link and knuckle, sent with the machine. The directions given for the Evarts Hand-Feed are in every respect applicable to this machine. Weight of machine, boxed for shipment, 1,500 pounds. One size only made, except to order.

PRICES.

With one 40-inch Saw	$330 00
Extra 40-inch Saw and Collar	65 00
Countershaft, tight and loose Pulleys and Boxes	50 00
Countershaft, tight and loose Pulleys and Patent Hangings	70 00
Idler Pulley, Shaft and Boxes, 12 inches x 12 inches face	15 00

This machine always needs a Countershaft and Idler Pulley to hold up the Belt, which runs on quarter twist.

LOW'S PATENT SHINGLE OR BARREL HEAD SAWING MACHINE.



This machine has been so long before the public, now 20 years, and its merits so well known, several hundred having been used, it seems unnecessary for us to speak of its good qualities. Its simplicity of construction, ease of operating, quantity and quality, as well as variety of work, renders it a general favorite. Among its other good qualities we would enumerate smoothness of work, but once setting of dogs till block is sawed up; the block or bolt fed vertically down upon the saw, thus relieving the saw of weight of block, causing no friction and leaving the shingle perfectly smooth and free from scratches; feeding shingle block one end at time instead of tipping saw to give taper, or both ends at same time for cutting barrel heading or box boards. It always cuts with the grain of the wood, and all done without the slightest danger to the operator. The saw to be set and filed does not require to be removed from the machine. It requires no mechanical skill to operate the machine when once in position, except to file and set the saw.

In new countries, remote from machine shops, this machine takes precedence. Government officials have adopted it at military stations in the Western territories as the best for their use, because any one can operate it, and it is not liable to get out of order. This machine is superior for flour barrel heading to any in existence—the shaft being horizontal, no countershaft is needed. The working capacity of this machine in white pine or cypress is from 20,000 to 30,000 shingles per day, or 12,000 in yellow pine—depending on the power used and the skill of the operator.

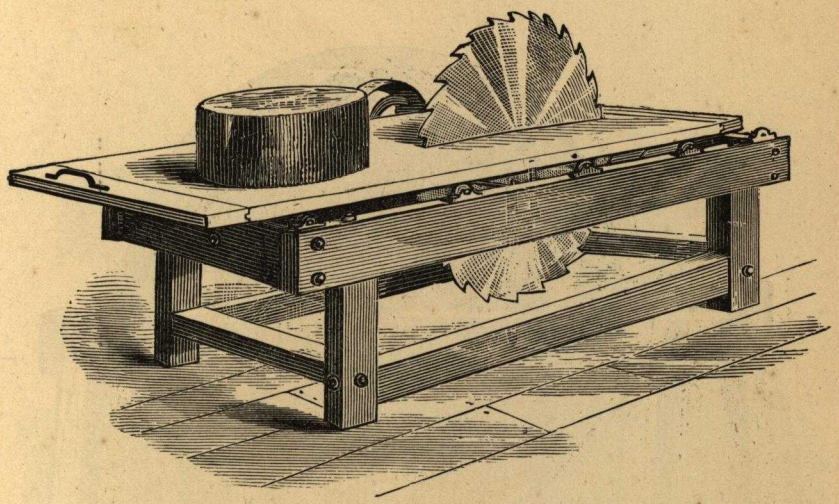
Size of pulleys 12 inches diameter, 7½ to 9½ inches face. Revolutions, 1,500 to 1,600. Shipping weight, 700 to 800 pounds. It requires from six to eight-horse power, according to size of saw.

PRICES.

Low's Patent, one 36-inch Saw, Hand-Feed, boxed	$240 00
Low's Patent, one 40-inch Saw, Hand-Feed, boxed	255 00

Larger sizes made to order.

BOLTING MACHINE, HAND FEED.



This machine is for dividing the blocks (after being cut off from the log) into bolts, ready to be sawed into shingles, barrel heading, box stuff, etc. It has proved not only to be a great labor saver, but saves a large portion of the timber, as any one may readily see; the timber being divided by a saw instead of an ax, there is nothing lost but the saw-kerf, and the first cut is a shingle; whereas, from a split block (particularly when the timber is winding) three and sometimes more cuts are made before you get a good shingle. It will save from 12 to 15 per cent. of the timber. It will bolt 6,000 to 10,000 feet of logs per day.

Size of pulley, 16 inches diameter, 10 inch face. Speed, 500 to 600 revolutions.

With the addition of a rack and pinion now attached and operated by a crank (not shown in the cut), one man can easily bolt enough for 75,000 shingles per day.

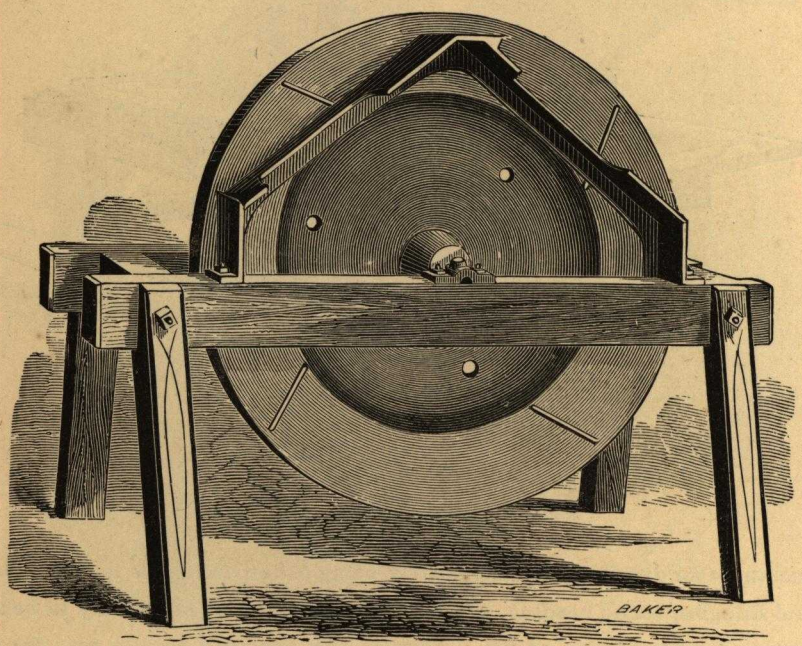
Price of 48 inch saw, hand-feed	$225 00

A machine with self-feed attachment will bolt from 15,000 to 20,000 feet of logs per day, or enough for large rotary shingle machine.

Price of Self-Feed Machine	$300 00

BURT'S SHINGLE JOINTER, OR EDGER.

OPERATED BY ONE OR TWO PERSONS.



This machine is of the most approved kind, solid bowl, 40 inches in diameter; long knife. It is adapted to jointing shingles, heading, tub bottoms, etc. We also make a double jointer of same size as the single jointer, using two wheels, with double rests; whereby four persons can joint shingles at the same time.

These are compact machines, all set up ready for use.

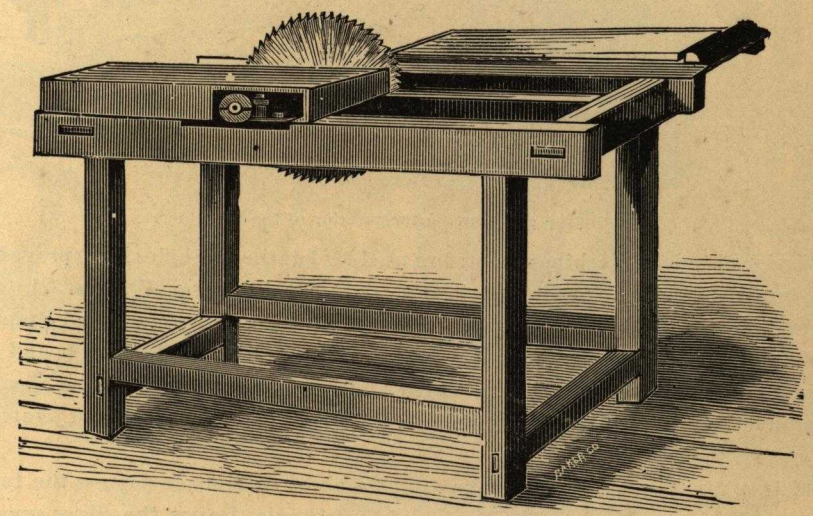
The above cut correctly represents our single wheel jointer. Speed, 500 revolutions per minute. Size of pulley, 12 inches diameter, 4 inch face.

Will joint shingles up to 18 inches in length with double rest, and up to 24 inches with single rest. Machines made with four and six knives.

PRICES.

Solid Wheel Jointers, in frames ready to run (boxed)	$50 00
Double Wheel Jointers	100 00
Jointer Wheel complete, without frame or rack	35 00

KNOT OR SAW SHINGLE JOINTER.



This little machine is particularly useful for jointing shingles made from knotty timber, as by its use the knot can be cut out without further waste. It is equally good for cutting off the sap edges of shingles. It is used alone and in connection with wheel jointers.

It is constructed in a substantial manner, furnished with steel arbor. Table works on iron slides, finished up so as to work easily and true. They are made double, and can be operated by one or two persons.

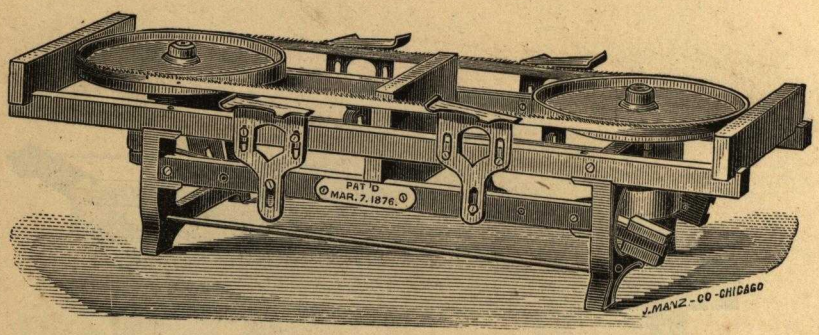
PRICE.

Double two 10-inch Saws	$50 00

These machines are becoming more generally used as they become known. Many factories are using them entirely—no other kind of jointer.

PATENT BAND SAW SHINGLE JOINTER.

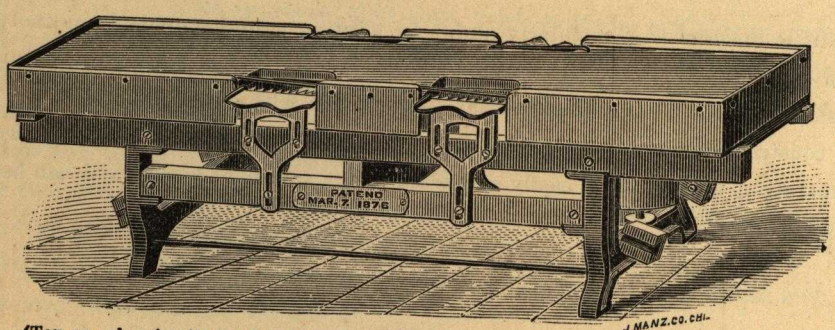
(Patented March 7, 1876.)



(Top off, showing the interior of the machine.)

The various kinds of machines heretofore used for jointing shingles have proved unsatisfactory from the imperfect work done and waste of stock. The Clipper or Wheels Jointer wastes large quantities of stock, and without extra care shingles thus jointed were in bad shape. Knot Saws, or Saw Jointers, using circular saws, leaves the edges of the shingles rough and ragged. Until the Band Saw Shingle Jointer was invented and introduced, there was no machine that gave entire satisfaction. But with this Jointer all the good qualities of all other jointers are retained, leaving out all the bad ones:

1. It is a rapid worker, as you have but a short distance to depress the table to joint the shingle. 2. The saw, running lengthwise of the shingle, leaves the edges smooth. 3. It is a perfect Knot Saw, or Splitting Saw, for knotty shingles. 4. It leaves the shingle square and perfect in shape. It is a very simple and durable machine, requiring but little power to operate it, being driven with a three-inch belt. It costs less for saws than the expense attending any other jointer for knives and saws.



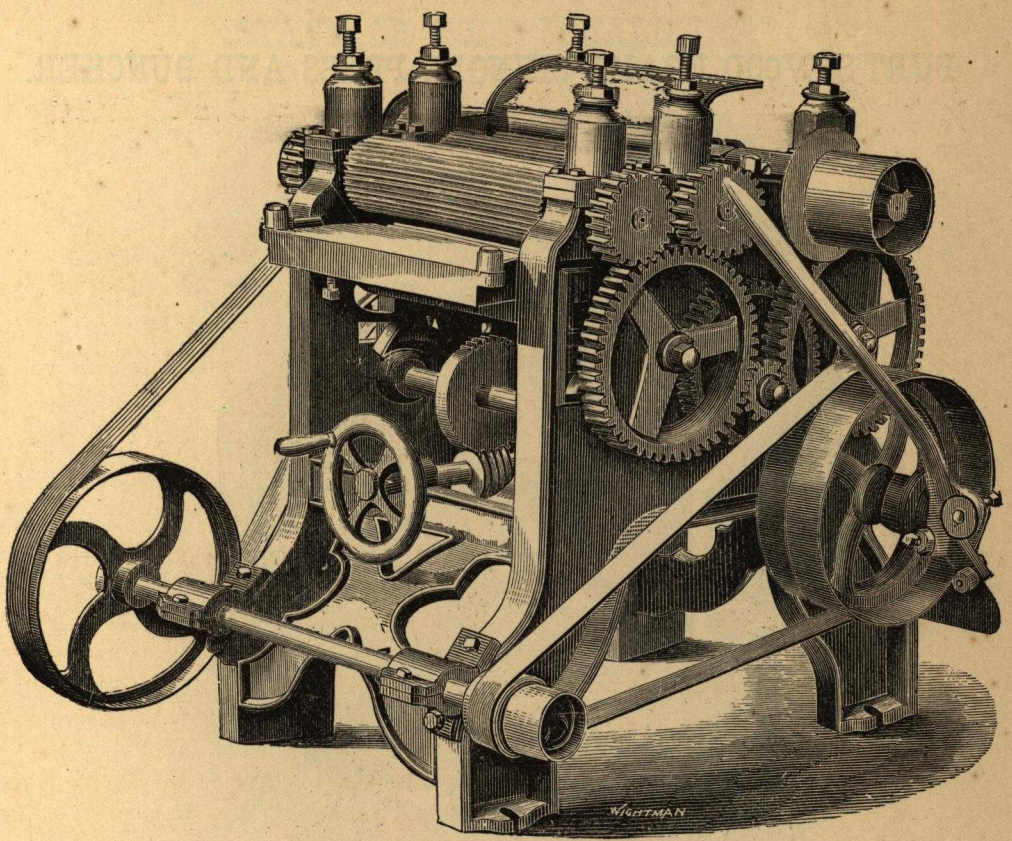
(Top on, showing its use for shingles to fall upon, so those jointing can reach them.)

PRICES.

Price of Jointer, for four operators	$250 00
Price of Jointer, for six operators	300 00

Two Saws with each machine.

HEADING AND SURFACE PLANER.



The above cut represents a 16-inch Planer for Heading. It has a tilting arrangement attached to the table so as to be used for planing tight barrel heading sawed tapering, and for straight heading, and any kind of surface planing. The table is raised and lowered by means of a hand wheel; no slackening or tightening of screws required, and the table stays just where it is set. All machines over 16 inches wide have pulley at each end of the cylinder; 16 inch machines are made that way, when ordered; there are three 4 inch feed rollers in the machine and one pressure roller, which has rubber springs, but is geared like the others. These machines have steel arbors and self-oiling boxes of the best construction, and have guide rollers at the edges of the table to prevent the stuff from running against the side of the machine.

All machines are fed from the cylinder shaft, instead of from the countershaft, as in most of Planers of this class, so that if your driving belts slip or run off, the feed slackens just in proportion as the cylinder slackens.

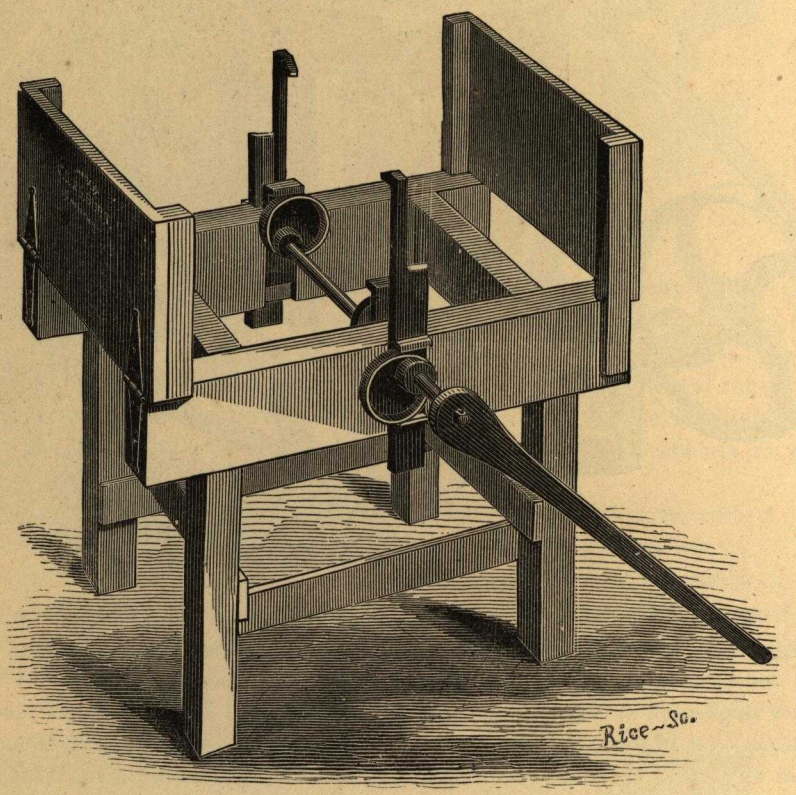
These machines can be used for ordinary surface planing; they will plane from $\frac{1}{4}$ to $2\frac{1}{2}$ or 3 inches in thickness, and as wide as the machines are. No. 1, *i. e.*, the 16 inch, will plane full 16 inches wide. Countershaft, fast and loose pulleys, 10 inch diameter, 6 inch face and should run 750 revolutions.

PRICES.

Weight 1,250 pounds, 24 inch wide, including countershaft	$235 00
Weight 1,200 pounds, 22 inch wide, including countershaft	230 00
Weight 1,120 pounds, 20 inch wide, including countershaft	225 00
Weight 1,000 pounds, 16 inch wide, including countershaft	200 00

Power required, according to work, 4 to 5 horse.

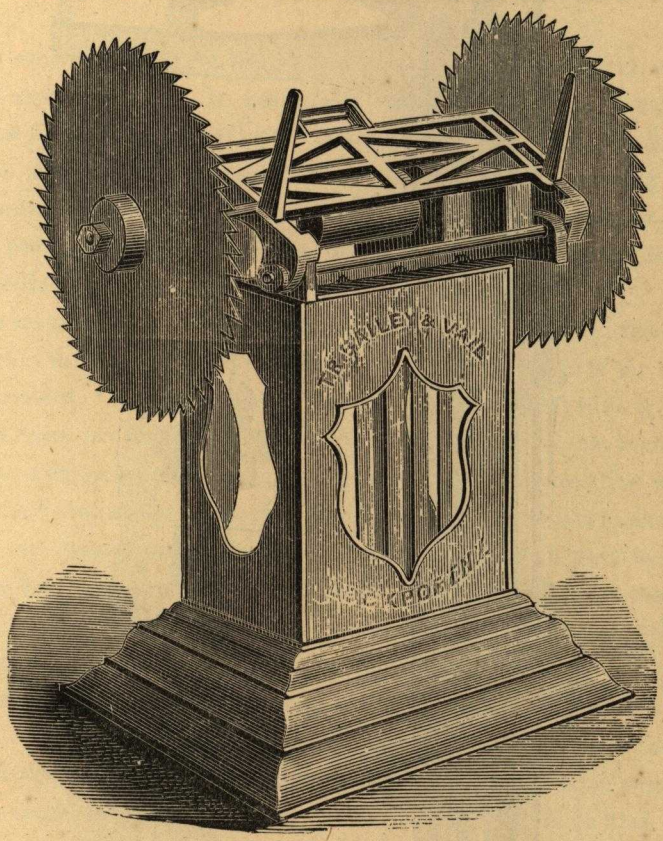
BURT'S WOOD FRAME SHINGLE PRESS AND BUNCHER.



To meet the demand of a large number of shingle manufacturers, who have been using a cheap and inefficient Buncher, we now offer to supply that want with a good and efficient Buncher at a price all can afford. This machine combines nearly all the advantages of the best machine in use, and will be found to be just what is wanted. It presses equally from above and below, and is self-locking. It is made to bunch 16 or 18 inch shingles with 20 inch bands. Other sizes made to order. In ordering, state length of shingle and width of band.

Price.....	$16 00

STAVE OR BOLT EQUALIZER.



This machine is of necessity one of the most important machines in the whole category of Stave Machinery, therefore needs to be made durable and strong. This is what we have aimed to do, and in furnishing this Equalizer, we think that it is the best that is made. The arbors are of steel, boxes self-oiling, and the table hanging on a rod; the staves are fed to the saw flat ways, thus avoiding the danger of tearing the staves and leaving the ends rough, as with most other saws. We furnish two sizes, one for staves, with 22 inch saws, or for bolts with 28 inch saws to cut from 28 to 31, or for tight barrel staves from 31 to 34 inches in length. For staves, Pulley is 5 inch diameter, 8 inch face. For Bolts, Pulley is 6 inch diameter, 8 inch face. Weight, complete, with Countershaft, 625 pounds. Weight, complete, without Countershaft, 400 lbs.

PRICE.

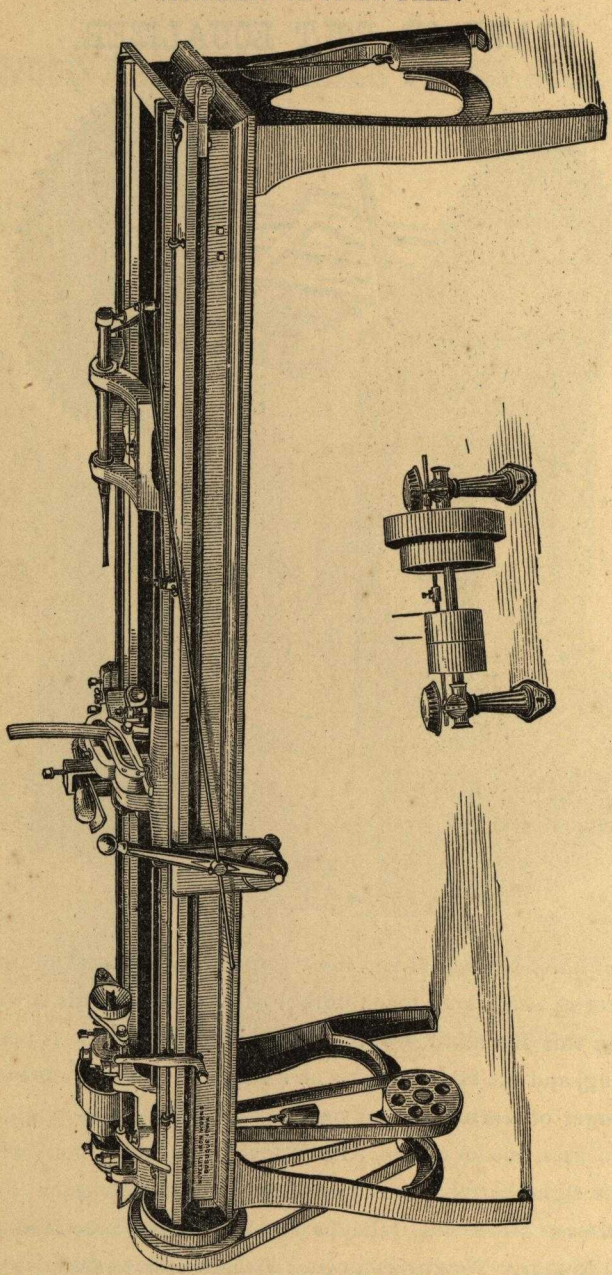
Stave Equalizer, with two 22-inch Saws	$65 00
Bolt Equalizer, with two 28-inch Saws	85 00
Countershaft	20 00

Speed of Countershaft, from 400 to 425 pounds, 12 inch tight and loose Pulleys.

Power required, 3-horse.

NEW COMBINATION GAUGE AND NULLING LATHE,

WITH HAND OR SCREW FEED.



SIZES AND PRICES.

Lathes to turn 7½ feet plain, with extra heavy head and tail block, and carriage, for heavy work, weight 1,000 lbs	$250 00
Lathes to turn 7½ ft. plain, ordinary size, weight 900 lbs	225 00
Lathes to turn 4½ ft. plain, ordinary size, weight 750 lbs	185 00
Lathes to turn 3½ feet plain, broom handles, weight 500 lbs	125 00
Combination Lathe (screw feed) to turn 7½ feet, weight 950 lbs	275 00
Combination Lathe (screw feed) to turn 4½ feet, weight 800 lbs	$235 00
Dies for 1½ inch and over, each	4 00
Dies for 1¼ inch and smaller, each	3 50
Knives for plain work, each	1 00
Knives for nulling or beading, each	0 75
Lathe Centre	1 50

NEW COMBINATION GAUGE AND NULLING LATHE.

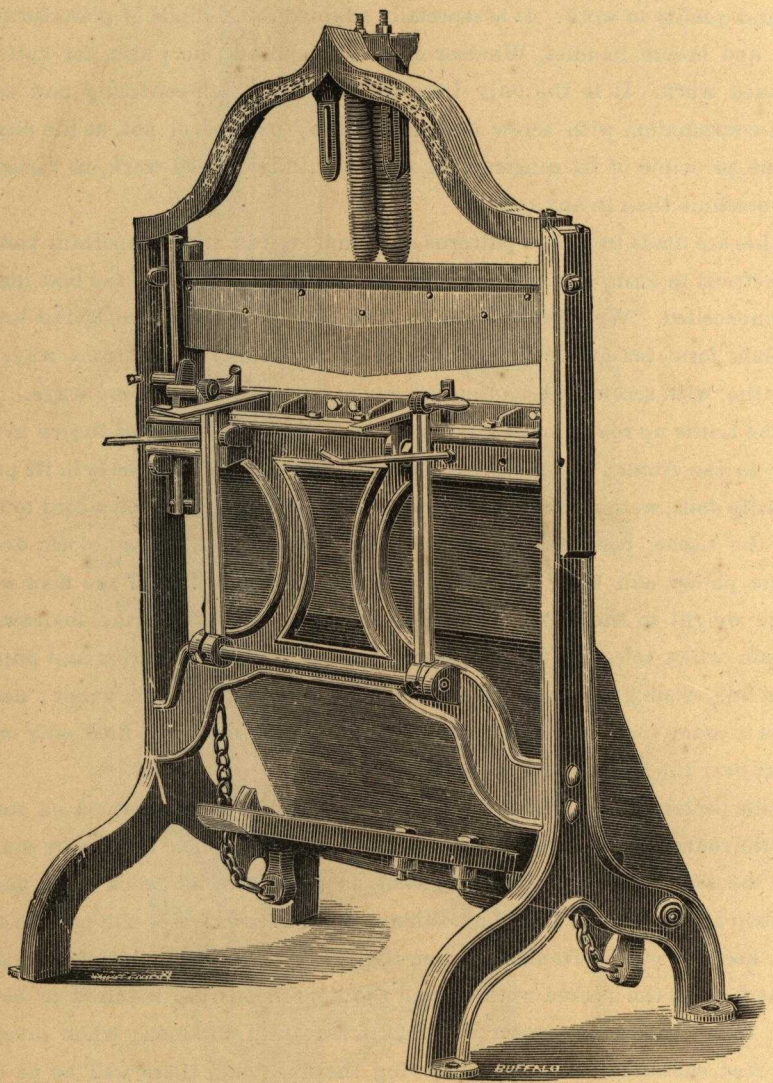
This Lathe is something new in the line of wood working machinery, and has no equal in speed, variety and quality of work. It is especially adapted to all kinds of plain turning, such as rake, hoe, fork and broom handles, Windsor chair legs, pillars, etc.; also, for various kinds of nulled and beaded work. It is the only Lathe that has the self-centreing and self-releasing attachments in combination with screw feed, which may be used or not, at the pleasure of the operator. In the principle of its construction, deeper nulling or bead work, in varied forms, can be done in this machine than in any other.

All our Lathes are made from new patterns and improved in many important points, making it at once symmetrical in form, stiff and strong in every part; all made of the best materials, and workmanship unexcelled. We build Lathes to turn 7½ feet, 4½ feet; also, 3½ feet broom handle Lathe, in the plain form (as formerly), with wood gauge on top of the front ways. Also, the Combination Lathe, with screw feed, having the gauge (of iron) between the ways.

In setting the Lathe up ready for use, put the machinery on the bed as shown in cut, bolting the legs firmly to the frame; use great caution, and see that each piece is in its proper place, which can be easily done, as the machine is simply constructed; then attach a cord to the bent rod at the head of the Lathe, passing it through, under the end of the head block, over the little roller, under the pulley, and hang the small weight within one foot of the floor when down; attach the large weight to the end of the long rod at the foot of the Lathe, to draw the puppet centre back again when released; oil well every part, especially the arbor and puppet centre; observe how the knives are ground, as it is important to preserve the same shape; never file the dies, unless it be to make them cut ahead faster, and then they should be filed only on the upper side, or that part over the largest part of the hole.

In making the pattern for the plain Lathes, fit a piece, of 1 x ⅞ hard wood on the top of the bed; fasten by the round-headed screws which accompany each Lathe. Do this by countersinking for the head of the screw; then shape the pattern as you wish your work done, and fasten the pattern to the strip already on the Lathe by common wood screws. Let the pattern run back by the tail block to keep the cutters from dulling on the centre. The iron pattern for the Combination Lathe is of same form as the desired work, except the depressions are required to be only about half the depth; with a little practice the proper form is readily obtained; when much cutting is necessary, slow feed should be used. By observing the foregoing, there will be no difficulty in obtaining first-class results. These Lathes will turn different kinds of work in ten hours, as follows: Broom handles, 2,000; hoe handles, 1,000; fork handles, 600 to 800; Windsor chair legs, 2,000; chair pillars, 2,000; nulled spindles for bedsteads, 1,000; and other kinds of work at same proportionate rate. Each of the 7½ feet and 4½ feet Lathes is fitted with 6 dies, viz: ¾, 1, 1¼, 1½, 1¾, 2¼ inch. The broom handle Lathe is fitted with one die, 1¼ inch, but smaller sizes may be used, if desired. Each Lathe is fitted with hangers, countershaft and pulleys. The tight and loose pulleys for large Lathes are 8 inch diameter, and should run 520 revolutions per minute. Broom handle Lathe, the tight and loose pulleys are 7 inches in diameter, and should run 600 revolutions per minute.

STAVE JOINTER.

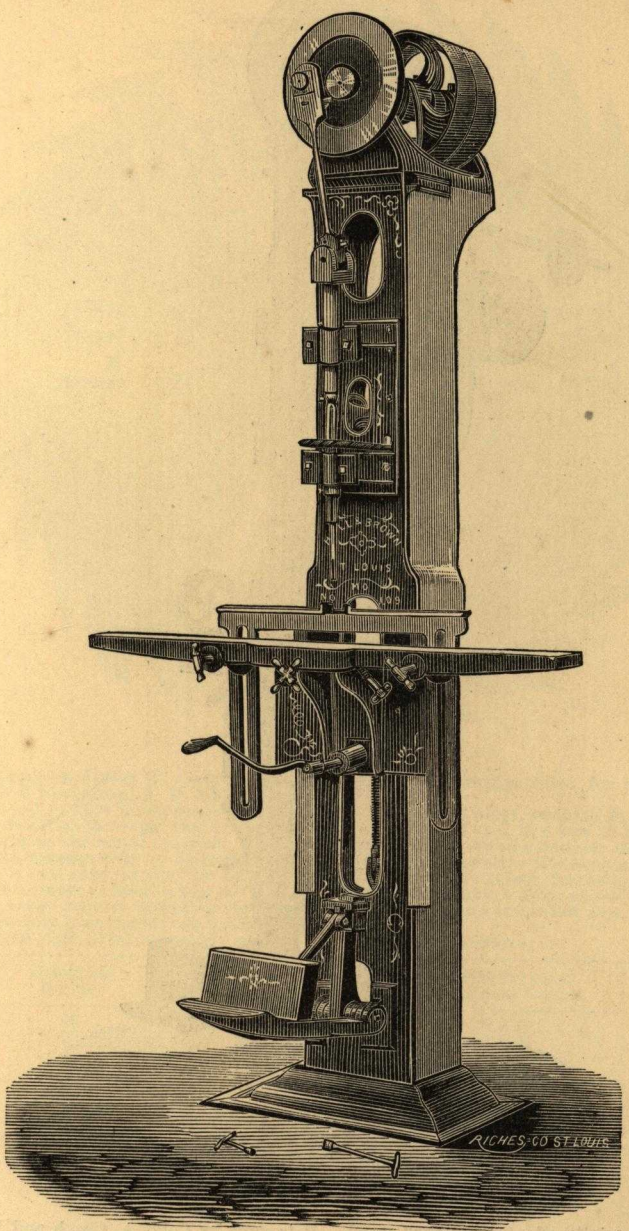


This machine, for jointing flour, salt, fruit and egg barrels, and made wholly of iron, is light and handy to move. These Jointers are made with a 32-inch knife, but parties in want of a larger machine can have it made to order.

Weight, 300 pounds; price	$65 00

We also furnish to order Jointers made with the knife stationary, and bed to raise, when preferred. Price the same as above.

DOOR AND SASH MORTISING MACHINE.

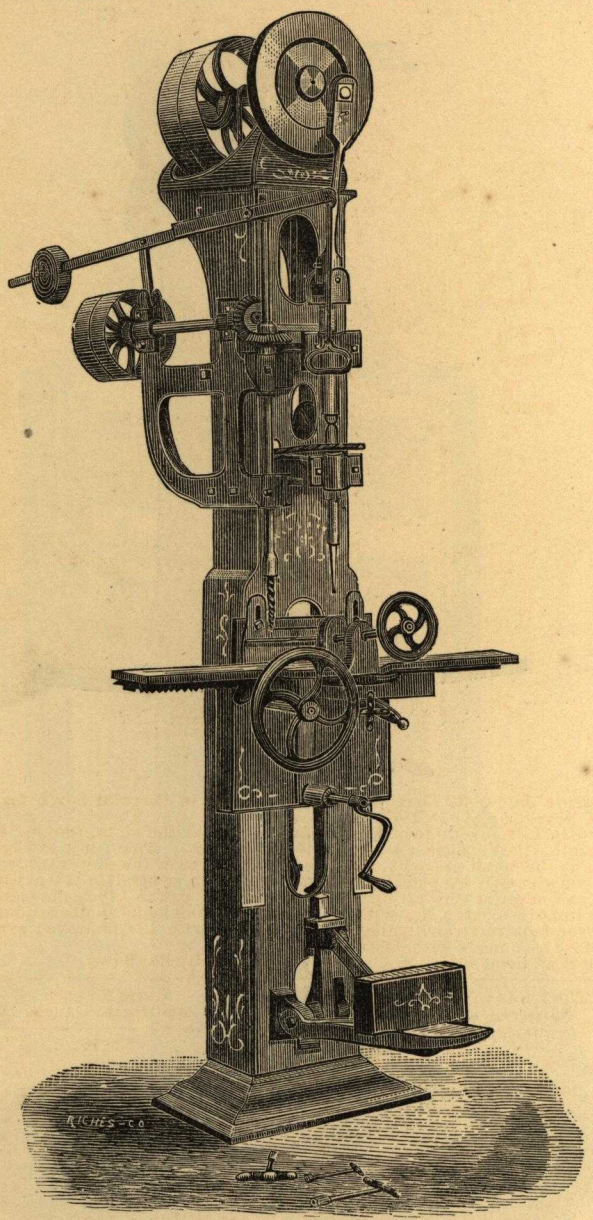


This Machine is intended for Mortising Doors, Sash, etc. It is strong and substantial in all its parts, and thoroughly built—the reverse Spindle connection and Straps being of steel. The table is adjusted vertically by means of a crank wrench beneath it for different thicknesses of material to be worked. The reversing arrangement is automatic, posture and simple.

The Pulleys are 12 inch diameter, 3 inch face, and should make 500 to 550 revolutions per minute.

Price	$190 00

CABINET MORTISING MACHINE, NO. 2.



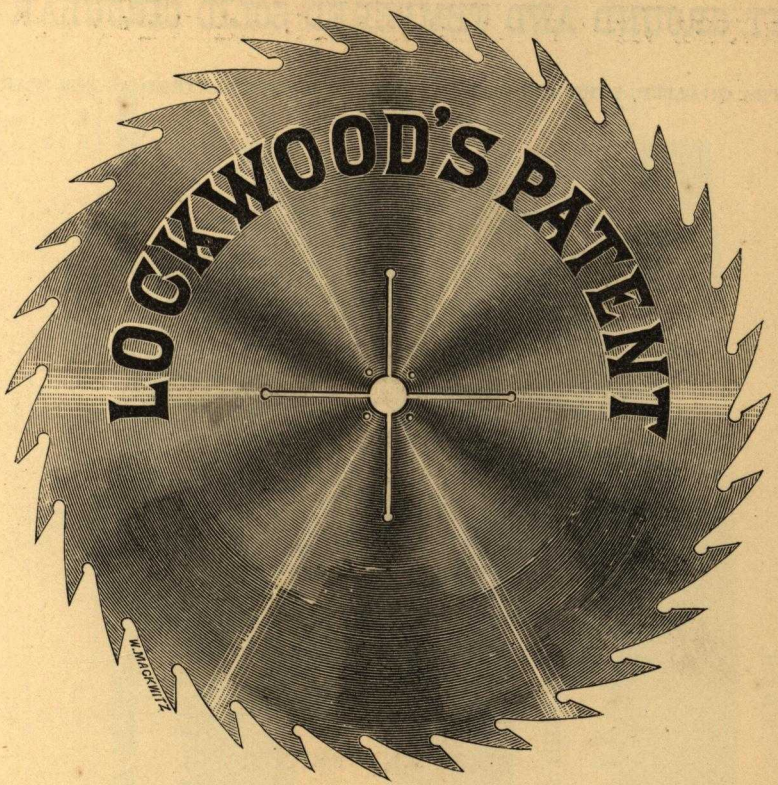
This Machine is especially adapted for hard wood. It is used by Cabinet, Coach and Wagon-makers, and for Agricultural Work. It is strong, heavy and substantial, and built with great care, the reverse spindles and connections all being made of steel. The bed is arranged so as to allow mortising on an angle, and has adjustments in every required direction. It is arranged for clamping, the stuff to be worked being clamped and moved under the chisel by a rack and pinion. The Machine is also provided with a boring spindle, which is set on same line of chisel, so the work can be bored, and then run under the chisel and mortised without releasing it from the bed; this is not wanted, however, on light work, and it is provided with clamp for holding the stuff; either can be used at the will of the operator. The reversing arrangement is automatic, simple and durable.

We send four chisels and four bits with each Machine. The Machine has pulleys 12 in. diameter 3 in. face, and should make about 500 or 550 revolutions per minute. The pulleys for the borer are 8 in. diameter, and should make about 1,000 revolutions per minute.

Price, with Clamp Table and Boring Attachment	$210 00
Price, with Boring Attachment	200 00

PATENT SLOTTED CIRCULAR SAW,

WARRANTED EXTRA CAST STEEL. PATENT GROUND.



The above cut represents James J. Lockwood's improvement in Circular Saws, for which letters patent were granted on the 12th day of November, A. D. 1867.

The principle involved in this invention of Mr. Lockwood is, that the slots, running in radial lines from the eye outward, completely neutralize the expansion or contraction of the saw. Thus: if a saw be heated at or near the eye, the slots close up as much as the metal expands, thus leaving the edge of the saw entirely unaffected. Or, if the edge of the saw be heated and consequently expanded, the slots, by opening, neutralize the expansion, and both the eye and the edge remain true. A saw never or very rarely becomes heated enough to injure the metal or the cutting capacity of the saw; hence, with this improvement, a saw will run equally true and make lumber equally well whether the saw is hot or cold, and will never require straightening. The lumber, with the improved saw, will be much truer and smoother than has heretofore been made with circular saws.

We have the exclusive right to manufacture Lockwood's Patent Circular Saws.

Diameter, Inches.	Thickness Gauge.	PRICE.	Extra for each additional Gauge.	Extra for each additional Gauge. Tapering—Net.
10	16	$ 3 15	$ 0 16	
12	15	3 95	0 20	$0 50
14	14	4 60	0 24	0 60
16	14	5 45	0 28	0 70
18	13	6 30	0 34	0 80
20	13	8 05	0 40	0 90
22	12	9 20	0 48	1 00
24	11	11 50	0 55	1 20
26	11	14 00	0 65	1 40
28	10	16 00	0 80	1 60
30	10	18 50	0 90	1 80
32	10	21 50	1 00	2 00
34	9	24 50	1 20	2 20
36	9	27 50	1 40	2 40
38	8	32 50	1 75	2 60
40	8	38 00	2 00	3 00
42	8	46 00	2 50	3 50
44	7	55 50	3 00	3 70
46	6	64 50	3 50	3 80
48	6	75 00	4 25	4 00
50	6	86 50	5 00	4 20
52	5	104 00	5 75	4 30
54	5	121 00	7 00	4 50
56	5	144 00	8 75	4 70
58	5	173 00	10 00	4 80
60	5	201 00	12 00	5 00
62	4	230 00	14 00	5 20
64	4	265 00	16 00	5 40
66	4	305 00	18 00	5 50
68	4	345 00	20 00	5 70
70	3	391 00	22 00	5 90
72	3	437 00	24 00	6 00

No extra charge for Saws one gauge thicker than list. One gauge beveling allowed on all Circular Saws larger than 38 inches.

PATENT GROUND AND TEMPERED SOLID CIRCULAR SAWS,

OF EXTRA QUALITY, SUPERIOR WORKMANSHIP, AND GUARANTEED AS PER WARRANTY.

SIZES AND PRICES.

Diameter, inches.	Size of Hole.	Thickness Gauge.	Price of Each.	Extra for each additional gauge. (Heavier.)	Prices for beveling new Saws. (Grinding or beveling old Saws, extra.)
4	¾	19	$ 0 80	$ 0 03	$0 18
5	¾	19	1 00	0 04	0 20
6	¾	18	1 20	0 05	0 25
7	¾	18	1 40	0 06	0 30
8	¾	18	1 70	0 08	0 35
9	¾	17	2 00	0 10	0 40
10	¾	16	2 30	0 12	0 45
12	1	15	3 00	0 17	0 50
14	1⅛	14	4 00	0 21	0 60
16	1⅛	14	5 00	0 25	0 70
18	1⅛	13	6 00	0 30	0 80
20	1¼	13	7 50	0 35	0 90
22	1¼	12	9 00	0 45	1 00
24	1¼	11	10 50	0 55	1 20
26	1⅜	11	12 50	0 65	1 40
28	1⅜	10	14 00	0 80	1 60
30	1⅜	10	16 00	0 90	1 80
32	1½	10	18 50	1 00	2 00
34	1½	9	21 00	1 20	2 20
36	1½	9	24 00	1 40	2 40
38	1½	8	28 00	1 75	2 60
40	2	8	33 00	2 00	3 00
42	2	8	40 00	2 50	3 50
44	2	7	50 00	3 00	3 70
46	2	6	60 00	3 50	3 80
48	2	6	70 00	4 00	4 00
50	2	6	80 00	4 50	4 20
52	2	5	90 00	5 00	4 30
54	2	5	100 00	6 00	4 50
56	2	5	115 00	7 00	4 70
58	2	5	135 00	8 00	4 80
60	2	5	160 00	9 00	5 00
62	2	4	185 00	10 00	5 20
64	2	4	210 00	12 00	5 40
66	2	4	235 00	15 00	5 50
68	2	4	260 00	18 00	5 70
70	2	3	295 00	21 00	5 90
72	2	3	335 00	24 00	6 00

Circular Saws to cut Metal or Ivory, double price. One gauge beveling allowed on all Saws larger than 38 inches.

PATENT TEMPERED CROSS CUT SAWS,

WARRANTED EXTRA FINE CAST STEEL.

COMMON TOOTH.

HOOKED TOOTH.

"CHAMPION."

COMMON TOOTH.

4 ft.	$2 00	7 ft.	$3 50
4½ ft.	2 25	7½ ft.	3 75
5 ft.	2 50	8 ft.	4 00
5½ ft.	2 75	8½ ft.	4 25
6 ft.	3 00	9 ft.	4 50
6½ ft.	3 25		

HOOKED TOOTH.

4 ft.	$2 00	7 ft.	$3 50
4½ ft.	2 25	7½ ft.	3 75
5 ft.	2 50	8 ft.	4 00
5½ ft.	2 75	8½ ft.	4 25
6 ft.	3 00	9 ft.	4 50
6½ ft.	3 25		

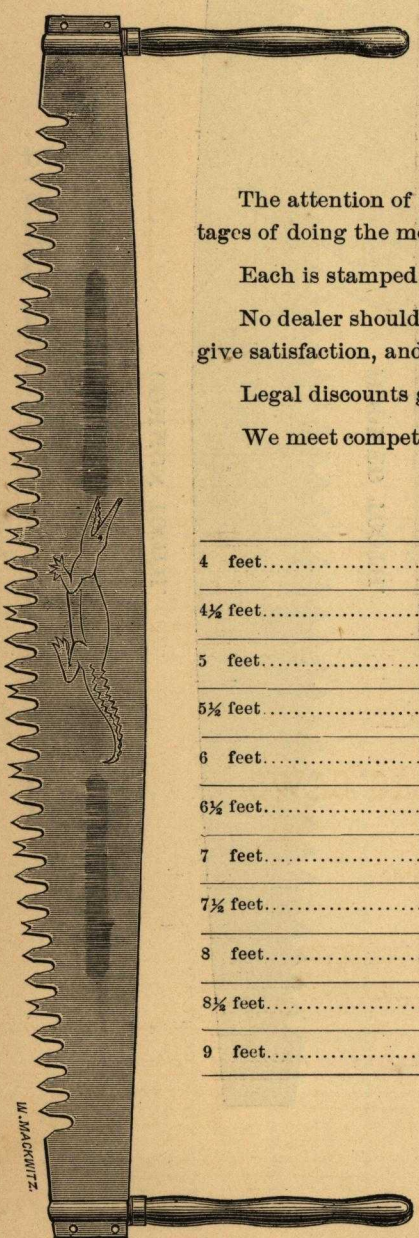
"CHAMPION."

5 ft.	$2 50	7 ft.	$3 50
5½ ft.	2 75	7½ ft.	3 75
6 ft.	3 00	8 ft.	4 00
6½ ft.	3 25		

The above prices are for Saws ground two gauges thin on Back. If ground four gauges thin on Back, the price is 60 cents per foot.

ALLIGATOR CROSS CUT SAW.

EASILY FILED AND SHARPENED, AND ALWAYS READY.



The attention of customers is called to this Saw as possessing the advantages of doing the most work with the least labor.

Each is stamped with our name and brand, and is fully warranted.

No dealer should fail to keep an assortment of these Saws, as they always give satisfaction, and no annoying complaints follow sales.

Legal discounts given to the trade.

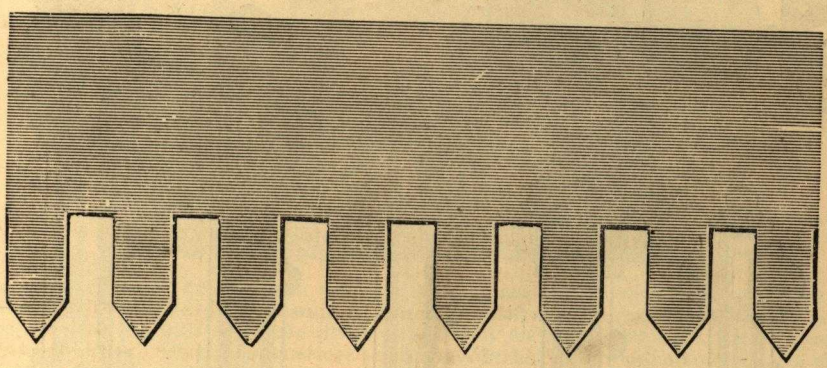
We meet competition, as regards quality and prices.

PRICES.

4 feet	$3 00
4½ feet	3 35
5 feet	3 75
5½ feet	4 10
6 feet	4 50
6½ feet	4 85
7 feet	5 25
7½ feet	5 60
8 feet	6 00
8½ feet	6 35
9 feet	6 75

LANCE TOOTH DRAG SAW.

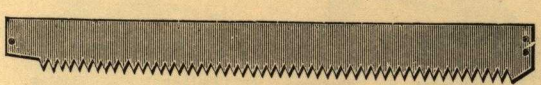
WARRANTED EXTRA CAST STEEL PATENT TEMPERED.



Size	8	9	10	Gauge.
9 inches wide	$1 60	$1 50	$1 40	per foot.
10 inches wide	1 80	1 70	1 60	per foot.
12 inches wide	2 40	2 20	2 00	per foot.
14 inches wide	3 00	2 70	2 40	per foot.

TAPERED BUTTING OR DRAG SAWS.

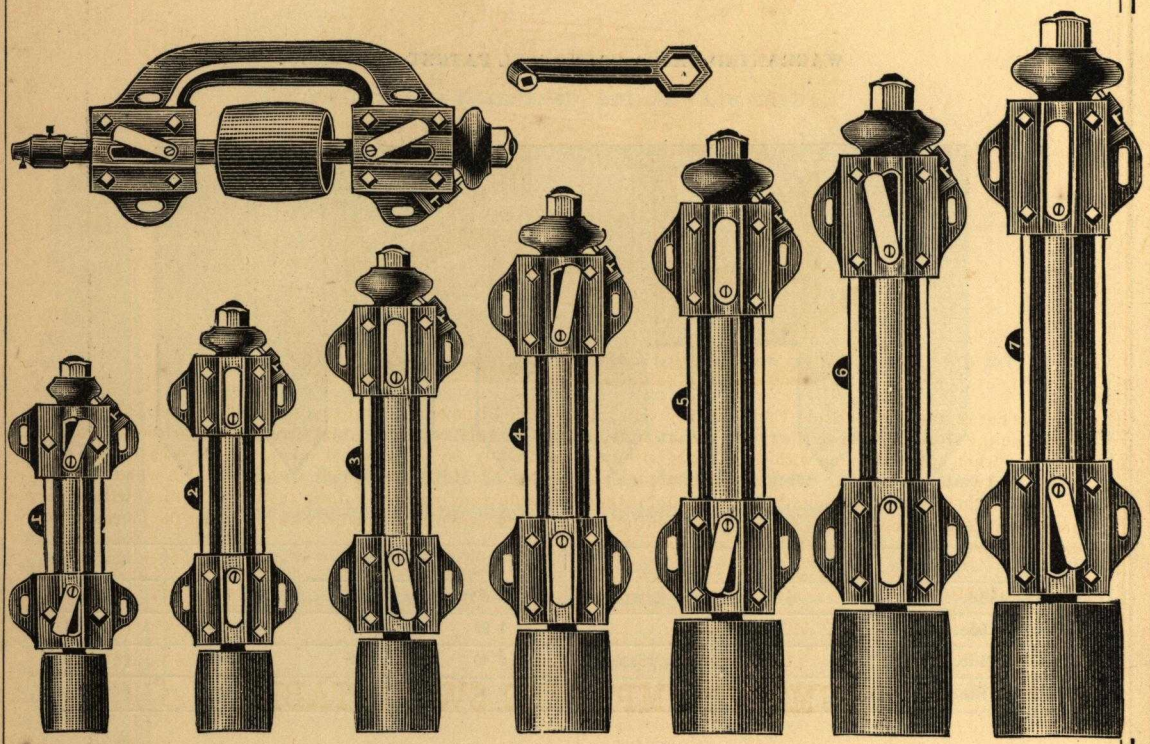
WARRANTED EXTRA CAST STEEL.



Tapered 7 inch butt, 5 inch point, No. 10 gauge, plain, per foot	$1 10
Tapered 8 inch butt, 6 inch point, No. 10 gauge, plain, per foot	1 20
Equal width, 8 inches, No. 10 gauge, plain	1 30

If set and sharpened, extra price. In ordering Drag saws, state whether mill saw or cross-cut teeth.

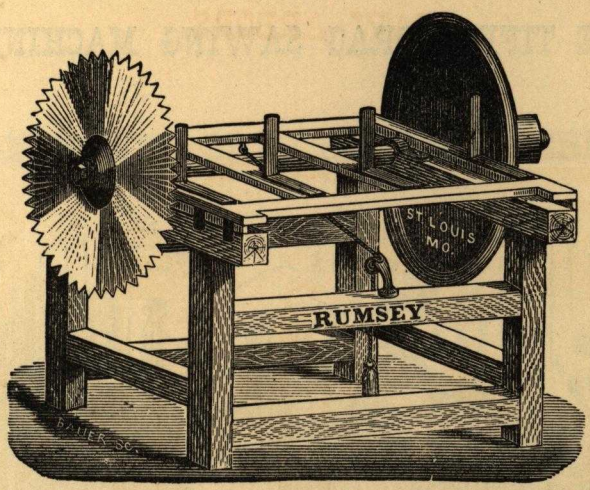
SAW ARBORS.



The above cut represents our seven sizes of Saw Arbors. These Arbors are made of the best refined cast steel and are finished in the best manner. The boxes are connected by a web in casting, which prevents them from getting out of line. The bearings are long, which makes them durable and prevents springing or trembling when in use. The pulleys are turned inside and balanced. The boxes are lined with the best Babbitt Metal. We arrange the cap with a large, covered oil cup for the reception of waste or tallow, which in our experience is the best method of oiling; then there is no excuse for running the mandrel dry. The mandrel is provided with a lock to prevent its turning while removing or securing the saw. When desired, we arrange the Yoke Arbor for boring on the opposite end from saw. We send one wrench with each Arbor that fits the cap bolts and the nut for each Arbor. The cut does not represent all the styles of Saw Arbors we make. We have patterns for different styles and sizes not given here. We are prepared to make any kind of Arbors our patrons may desire; we make them for swing-cut-off saws. We also make wide between collars to use planing dado or groover heads.

Numbers of Arbors.	Extreme Length from out to out of Journals.	Size of Mandrel.	Diameter of Pulley.	Face of Pulley.	Diameter of Collar.	Hole in Saw.	PRICE.
1	12	⅞	3	3⅛	2⅛	¾	$ 9 00
2	14	1	3½	4	3	¾	10 50
3	16	1	4	4½	3½	1	12 00
4	18	1⅛	4½	5	4	1	13 50
5	20	1¼	5	5½	4½	1⅛	15 00
6	22	1⅜	5½	6	5	1¼	16 50
7	24	1½	6	6½	5½	1⅜	18 00

SLIDE TABLE WOOD SAWING MACHINE.

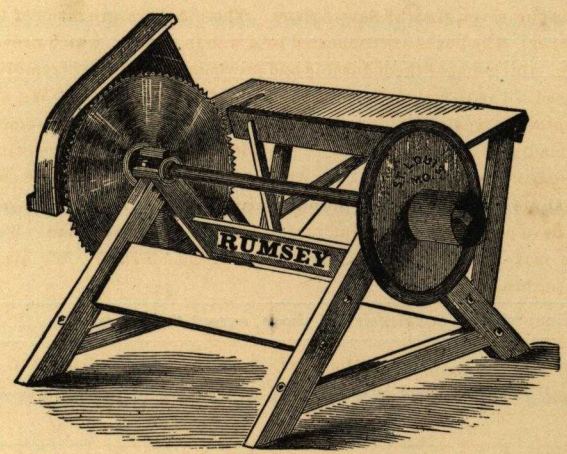


This cut represents our Slide Table, 24-inch Saw, a machine in general use for sawing wood for fuel. The wood is placed on the sliding frame on the top of the machine, against the small uprights, and then pushed with the frame to the saw; when cut, the frame with the stick is withdrawn and ready for the renewed operation. It is easily driven by a one or two-horse power. We also manufacture an improved Slide Table, which we can furnish when specially ordered. The saw is twenty-eight inches in diameter; the table runs on iron rollers instead of slides, with a very heavy shaft and balance wheel, and a ratchet pulley. The boxes have oil cups and covers to protect the journals from dust and dirt. The saws are filled and set ready for use.

Price, with 24-inch saw	$65 00

RUMSEY'S IMPROVED SWING TABLE,

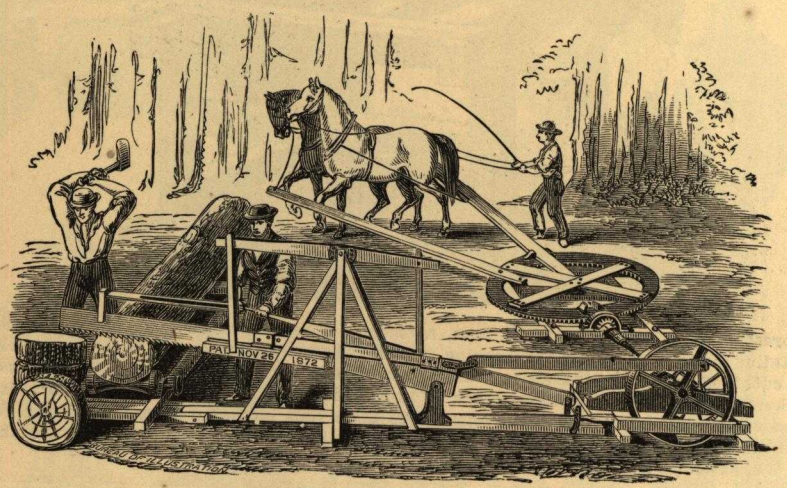
FOR SAWING WOOD.



This cut shows our Improved Swing Table, 24-inch Saw, for sawing wood. The table is just balanced, swinging on centres, as will be seen in the cut. It is very easy for the operator, who only has to lay the timber or wood on the table and swing it to the saw, which is a great improvement on the slide table. They are extensively used in railroads, wood-yards, etc. We also make a larger size, with a heavier shaft and balance wheel, 28-inch Saw and ratchet pulley, which only has to be seen to be admired. All of our Saws have oil cups and covers to protect the bearings from dirt and dust, thereby making them more durable. The saws are filed and set ready for use.

Price, with 24-inch Saw	$68 00

THE TIFFIN DRAG SAWING MACHINE.



Drag Sawing Machine, complete, consisting of Horse Power, 4 Wooden Levers, Tumbling Rod, Jack, Patent Saw Frame, one 5½-foot equal width Saw, Track, Log Car, Gig Roller and Lever, Dog, Wrench, Sledge, Bolts for Levers, and Bolts and Rings to pull by.

Price, complete	$135 00

In many parts of the country good Levers can be obtained very easily, and freight saved thereon.

Price of Drag Sawing Machine, with all articles named above, except the Lever	$125 00

The above Machine can be used with two, four or six horses.

The Power and Jack are just the things to have on a farm to run Feed Cutters, Grinders, Cider Mills, Corn Shellers, etc.

STEAM POWER DRAG SAWING MACHINE.

Our Drag Sawing Machine, for Steam Power, is made with a Pulley on the Jack, to which the Belt, running from an Engine or a Line Shaft, is attached. It is made for durability and business, and will cut an enormous quantity of wood in a day.

The price of the above Machine, all complete, ready to attach belt, is.....	$75 00

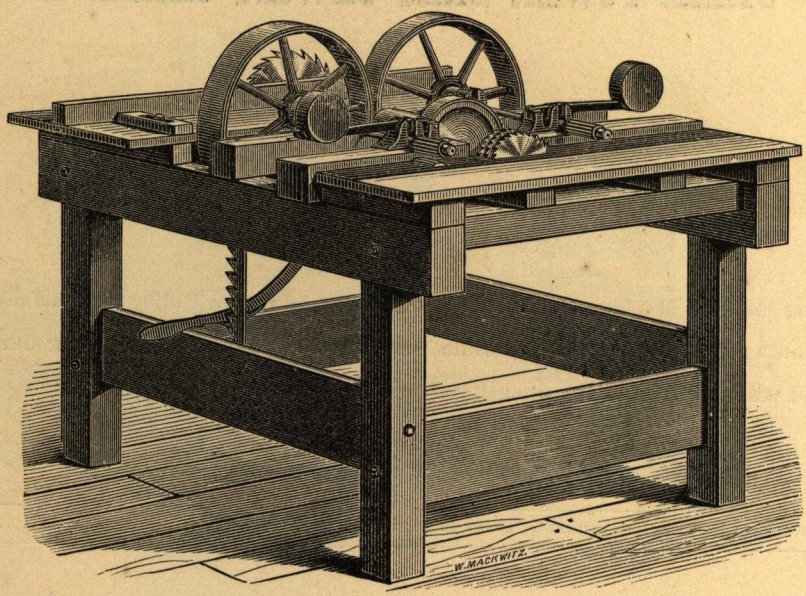
(In ordering the above Machine please state the size and speed of the Drive Pulley.)

We also make a Drag Sawing Machine, with Jack arranged so it can be run by a large 8 or 10-Horse Power.

Price of same, complete, ready to connect Tumbling Rod.....	$70 00

Men who have Farm or Threshing Engines, or large Horse Powers, can put them to good use by purchasing one or the other of the above-described Machines.

LATH AND BOLTER MACHINE.



The above cut represents our combined Lath and Bolter Machine, which has received all the additions and improvements that an extensive use could suggest.

We offer it now as a perfected machine, and, from its easy operation and simple construction, is adapted to the wants of those who desire a good machine at a small cost.

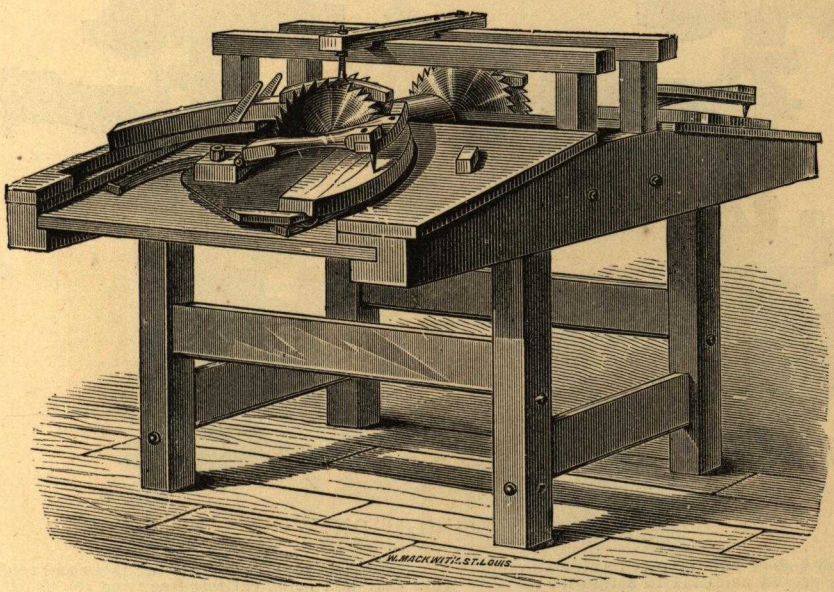
It is adapted for three Saws. Saw Mandrel and Feed Shafts are made of steel. Mandrel 1½ inches. The feed rollers are driven by a 3½ inch belt from the saw mandrel and controlled by two small idler pulleys, which are held in place to work by a lever and ratchet, forming a substantial and positive feed, and can be started and stopped at the will of the operator.

The pulley on Saw Mandrel is eight inches diameter, nine inches face, and should be run about 2,800 revolutions. The feed table is provided with a shield of steel its entire length.

Price of Combined Machine, with Balance Wheel, Belts, 3 Lath Saws 11 ins. in diam., 1 Bolter Saw 16 ins. in diam.	$150 00
Counter-Shaft (extra)	30 00

800 Revolutions a minute.

FELLOE SAWING MACHINE.



In consequence of the great demand and relative high price for Wagon Felloes, we recommend their manufacture to those having suitable material.

With our Machine, a cut of which is given, it is easy to produce from 5,000 to 6,000 perfect Felloes in ten hours. We have made some recent additions, largely increasing its efficiency, and while lighter in construction, it is much stronger.

It consists of a Mandrel, with Pulley and Boxes, four Concave Saws, two of which are on one end of the Mandrel to cut Felloes for the Front Wheel, and two on the other end to cut Felloes for the Hind Wheel, with washers between saws to allow the cutting of different thicknesses as desired.

A frame, constructed of the best seasoned material and in the most substantial manner, each end of which is provided with Improved Revolving Iron Table, placed on rollers and revolving on an iron track immediately underneath. On this the timber to be sawed is placed and fed to the saws with but slight exertion. The Pulley, 8x9 inches, should be driven by an 8 or 9 inch belt and run about 2,500 revolutions.

PRICE OF MACHINE, COMPLETE.

With 2 Twelve and 2 Fourteen-Inch Concave Saws	$170 00
With Fifteen and Sixteen Inch Saws	175 00

WATERS' PATENT STEAM GOVERNORS.

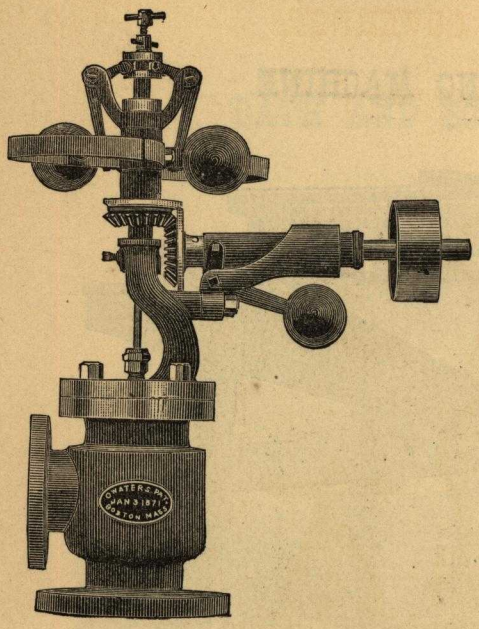


Fig. 7.

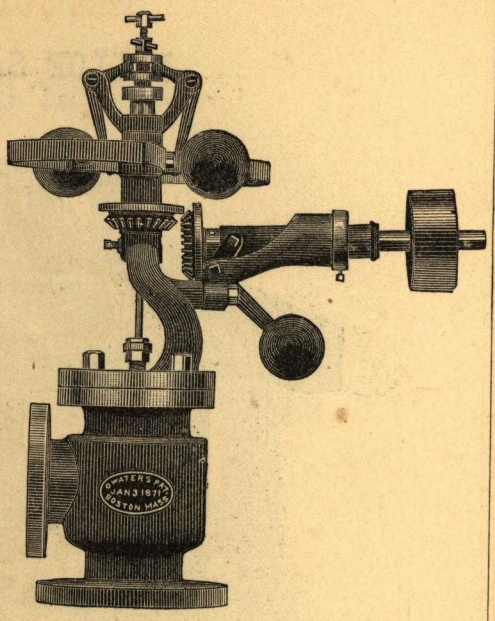


Fig. 8.

DESCRIPTION.

Figs. 7 and 8 show our improved Automatic Safety Stop, which is rapidly gaining the favor and confidence of the trade, having proved unfailing in action for the four years past, and being entirely free from the usual objections of sticking or gumming, so common and fatal to other styles. Fig. 7 shows the revolving head resting on a disk fastened to the back of the gear, and the strain of the belt, while on the pulley, holds it in this position; but when the belt runs off or breaks, the weighted lever drops, throwing the shaft back out of gear, allowing the top to drop and close the valve, as shown in Fig. 8. To start again, simply raise the top part and lift the weighted lever into position, and hold it while putting on the belt. This device works equally well with either horizontal, vertical or angular belt, and only when the belt breaks or runs off; consequently, never use flanged pulleys, which would prevent the belt going off.

☞In ordering Governors, be particular to say, with or without "Automatic Safety Stop," with or without Stop Valve, whether Black or Finished, and whether Screwed or Flanged Connections. Pulley Flanges are furnished gratis. Always specify size of Pulley, if one is required. (See last column of table.)

☞Notice size of Governor and Steam Pipe to diameter of Engine Cylinder and Piston Speed; also, diameter of Side and Base Flanges or whether Screwed for Steam Pipe, diameter and face of Pulley and Speed in table below.

PRICE LIST AND TABLE OF DISTANCES, ETC.

Size of Valve or Diam. of Steam Pipe.	Price, Black.	Price, Finished.	Extra for Automatic Stop on 2 inch and up.	Diameter of Cylinder suitable for.	Extreme Height.	Diameter Space required.	Distance from Base Flange to Centre of Steam Pipe.	Distance from Centre of Governor to Stop Valve.	Distance from Centre of Governor to end of Pulley Shaft.	Diameter of Base Flange.	Diameter of Stop Valve Flange.	Speed of Governor, Revolutions per minute.	Diameter and Face of Pulley preferred.	Net price of Pulleys.
½ in.	$ 17	$ 20		2 to 3 in.	10¼ in.	5¼ in.	2 in.	1⅛ in.	6 in.	3½ in.	Screwed for Steam Pipe.	275	2 x ¾ in.	$ 50
¾ "	19	22		3 to 4 "	13⅛ "	9 "	2¾ "	1⅞ "	8⅛ "	4 "		260	2½x1 "	50
1 "	21	24		4 to 5 "	14 "	9 "	3 "	2⅛ "	8½ "	4½ "		260	2½x1 "	50
1¼ "	24	28		5 to 6 "	16 "	10 "	3¼ "	2⅛ "	9½ "	5 "		240	3 x1¼ "	55
1½ "	27	32		6 to 7 "	19 "	14 "	3¾ "	2⅝ "	10½ "	6 "		210	3½x1¼ "	55
2 "	32	38	Extra for Safety Ch'k	7 to 8 "	21 "	18 "	4⅛ "	3⅛ "	13½ "	7 "		200	4 x1¼ "	65
2½ "	42	48	$ 6 00	8 to 10 "	24 "	18 "	5 "	4⅛ "	14 "	8 "		200	4 x1½ "	65
3 "	54	63	7 00	10 to 12 "	28 "	22 "	5¾ "	5⅛ "	16 "	9 "	6½ in.	150	5 x2 "	80
3½ "	65	75	8 00	12 to 14 "	30 "	22 "	6¼ "	6 "	17 "	10 "	7 "	150	5 x2 "	80
4 "	76	86	9 00	14 to 16 "	34 "	25 "	6⅜ "	6¼ "	20 "	11 "	8 "	150	6 x2 "	90
4½ "	88	100	11 00	16 to 18 "	36 "	25 "	7⅛ "	7 "	21 "	12 "	8½ "	150	6 x2 "	90
5 "	100	115	12 00	18 to 20 "	38 "	25 "	8¼ "	8⅜ "	22 "	13 "	9⅛ "	150	6 x2 "	90
6 "	133	150	14 00	24 to 28 "	42 "	34 "	10 "	8⅝ "	23 "	14 "	11 "	150	6 x2 "	90
7 "	158	180	16 00	28 to 32 "	44 "	34 "	10½ "	10 "	24 "	15 "	12 "	125	8 x2½ "	1 35
8 "	192	220	18 00	33 to 36 "	50 "	40 "	12 "	11 "	26 "	16 "	13 "	125	8 x2½ "	1 35
9 "	215	245	20 00	36 to 40 "	52 "	40 "	13 "	12 "	28 "	18 "	14 "	100	10 x2½ "	1 90
10 "	240	275	25 00	40 to 44 "	66 "	48 "	14 "	13¼ "	30 "	20 "	15 "	100	10 x2½ "	1 90
											16 "	100	12 x3 "	3 00

The speed noted in table is only average; the correct speed is plainly stamped on the top brass collar of each Governor. Arrange the Pulley diameters to give this speed at the desired speed of Engine. Then, by the screw at top of Governor, the speed may be correctly adjusted or changed in either direction. They do not require the wide, heavy belt used on others. We invariably prefer a thin, flat belt, of uniform thickness, and advise all who require close regulation to pay particular attention to this matter. The sizes of Pulleys in the last column but one of the table are such as are in proportion to each Governor, and we always have them on hand, fitted to their respective sizes. They are light, and much neater in appearance than wooden ones. Other sizes may be used with safety, or a round belt, if desired. In any case, use true pulleys and a nice, even belt, without clumsy joints.

THE JUDSON GOVERNOR,

FOR STEAM ENGINES.

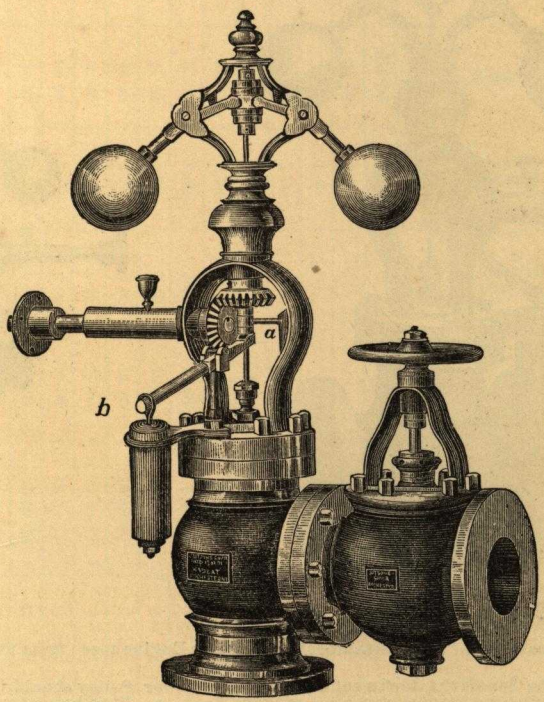


Fig. 1.

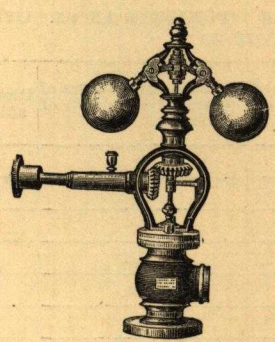


Fig. 2.

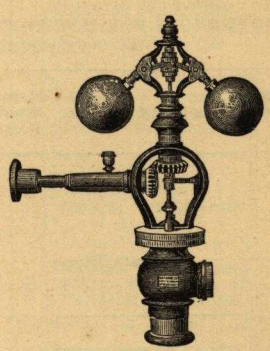


Fig. 3.

Fig. 1 represents Governor, Governor Valve and Stop Valve combined, Speeder for altering speeds, Sawyers' Lever and Stop Motion.

Fig. 2 represents Governor with Base Flanged, Side Screwed.

Fig. 3 represents Governor with Base and Side Screwed.

Governors larger than 2 inch are not screwed, except $2\frac{1}{2}$ inch, which is screwed on side.

For Price-List, see page 419.

JUDSON GOVERNORS.

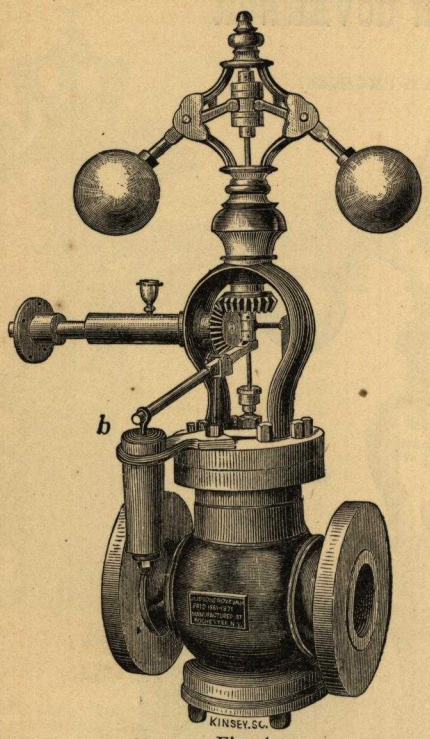


Fig. 4.

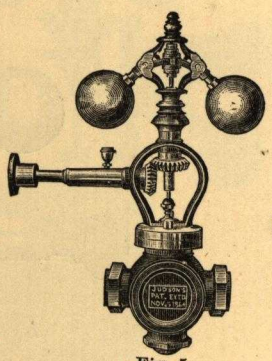


Fig. 5.

On Fig. 4 see Spring Speeder at *b*. This attachment will change Engine speed from five to forty per cent., as may be desired.

TAKE NOTICE.—When the Speeder Attachment is used, the Governor Pulley should be about five per cent. less in diameter than would run the engine the desired speed without Speeder. Then by screwing up the Speeder nut and condensing the Spring, the motion of the engine will be increased to the desired speed, and the valve held steady by the increased Spring Tension. The Speeder is not required on engines that are to run at one speed constantly, but should be used when fly wheel is too light, causing the Governor to be jerked by the piston.

DIMENSIONS OF GOVERNORS FOR HORIZONTAL STEAM PIPE. FIGURES 4 AND 5. OTHER DIMENSIONS AND PRICES SAME AS PAGE 419.

Capacity of Valve or Inside Diameter of Steam Pipe. Inch.	Diameter of Flanges.	Distance from Centre of Steam Pipe to Centre of Pulley Shaft.	Distance from Centre of Steam Pipe to Top of Governor.	Distance between Outside Faces of Flanges.
¾	Screwed for Steam Pipe.	3½	9	4½
1		4¾	11	5
1¼		5⅝	15	5¾
1½		7¼	17¾	5¾
2		8¾	18¾	7¾
2½	7	10	24	9
3	8	12	27	10⅝
3½	9	12⅞	28⅜	12
4	10	13⅜	31⅜	12¾
4½	10½	14½	34¼	14
5	11	14⅞	34⅝	15
6	13	17	41	16⅞
8	16	19½	45½	19¾
9	17	22	51	22
10	19	25	53	25
12	20½	26½	54½	27

Governors of the style of Figures 4 and 5, smaller than 2½ inch, are screwed. Sizes larger, and including 2½ inch, are flanged.

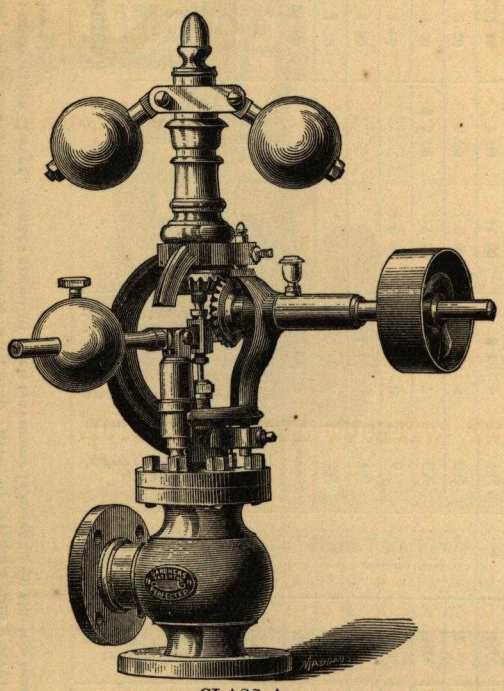
PRICE LIST JUDSON PATENT IMPROVED GOVERNORS.

FIGURES 1, 2, 3, 4 AND 5.

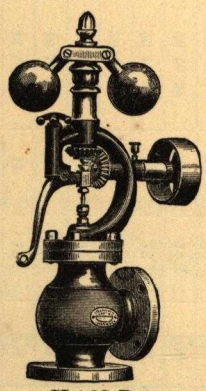
☞When Governors are ordered, be particular and say, Governor with Stop Valve, or without Stop Valve; and either Plain or Bright Finish, as you may require, and with or without Speed Changer, Stop Motion or Sawyers' Lever. Exact speed of each Governor is marked on the top head.
See also column of Speed in Price List.

Capacity of Governor, or Diameter of Steam Pipe, in inches.	PRICE.					Size of Governor to Diameter of Engine Cylinder at ordinary speed of Piston (300 ft. per minute). For greater speed, use larger Governors.	Diam. of Base Flange, in inches.	Diam. of Side Flange, in inches.	Distance from Base Flange to Centre of Steam Pipe, in ins.	Distance from Centre of Governor to end of Pulley Shaft, inches.	Extreme Height, inches.	Distance from Base Flange to Centre of Pulley Shaft, inches.	Distance from Centre of Governor Valve to Stop Valve, in ins.	Speed of Governor. No. of Revolutions per minute.	Greatest Expansion of Balls, in inches.	Diameter and Face of Pulley that should be put on each Governor to drive it properly, in inches. ☞
	Plain.	Bright Finish.	Spring Speeder for altering speed.	Stop Motion and Spring Speeder.	Improved Stop Valve.											
½	$ 15 00	$17 00	$1 60	.....	....	2 to 3	Screwed.	Screwed for Steam Pipe.	2	7	11½	5⅜	1⅝	320	8¾	3 x1
¾	16 00	18 00	1 70	.....	....	2 to 3	3¾		3	7	12¾	6⅝	2	320	8¾	3 x1¼
1	18 00	20 00	1 80	.....	....	4 to 5	4½		2⅜	7⅛	13⅜	7⅝	2⅛	160	9¾	3½x1¼
1¼	20 00	23 00	1 90	.. ..	$ 6 00	5 to 6	5		3	10¼	18¼	8¾	2⅛	140	12	4 x1¼
1½	23 00	27 00	2 00	$ 5 00	7 50	6 to 7	5¾		3⅜	11¾	20⅛	10¼	3	135	12¾	4 x1½
2	27 00	31 00	2 20	6 00	9 00	7 to 8	6½		4	12½	23	12⅞	3	135	13½	4½x1½
2¼	32 00	37 00	2 40	7 00	11 00	8 to 9	7½	6	4¾	¾	26¾	14	4¾	110	17¼	5 x2
2½	36 00	41 00	2 60	7 00	12 00	9 to 10	7½	Screwed.	4¾	14¼	28	14¼	4	105	18	5½x2
2¾	40 00	46 00	2 80	8 00	14 00	10 to 11	8½	7	5⅛	14¼	28¾	15¼	5⅝	105	18	6 x2
3	45 00	52 00	3 00	8 00	17 00	11 to 12	9	8	5¾	15½	32¾	17½	6	98	19¾	7 x2
3½	54 00	62 00	3 25	9 00	21 00	12 to 14	10	9	6½	17	37½	19¾	6½	98	21¾	8 x2
4	64 00	73 00	3 50	10 00	25 00	14 to 16	11	10	7¼	18½	38	20⅛	7	95	25¼	9 x2½
4½	74 00	84 00	3 75	11 00	31 00	16 to 18	11½	10½	7½	21	42	22¼	7	92	28	10 x2½
5	84 00	95 00	4 00	12 00	37 00	18 to 20	12	11	7¾	21	42½	22¾	7¼	92	28	11 x3
5½	97 00	109 00	4 25	14 00	42 00	20 to 23	13	12	8⅛	22	48	24½	8	85	32	12 x3
6	110 00	123 00	4 50	15 00	50 00	23 to 26	14	13	9¼	23	50	26⅜	8¼	77	35	14 x3½
7	130 00	144 00	5 00	17 00	60 00	26 to 28	15½	14½	9⅛	23	51	27⅜	9	77	35½	14 x3½
8	160 00	175 00	6 00	19 00	75 00	28 to 30	17	16	10⅛	24	55½	30	10	70	37½	16 x4
9	180 00	196 00	7 00	21 00	.....	30 to 33	18	17	11¾	26	59	33⅝	11	70	40	18 x4½
10	200 00	218 00	8 00	23 00	.....	33 to 37	20	19	13¼	26	63	37	12⅝	70	40	18 x4½

GARDNER'S PERFECTED GOVERNOR.



CLASS A.



CLASS B.

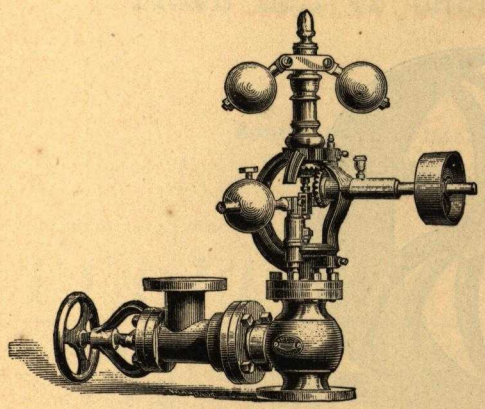
TABLE OF DIMENSIONS.

Size of Gov.—Diam. of Opening..	¾	1	1¼	1½	2	2¼	2½	3	3½	4	4½	5	6	7	8
Diameter of Base Flange.....	4	4½	5	5½	7	7	8	9	9	10	10	12	14	15	17
Diameter of Side Flange.....	Scr'd	Scr'd.	Scr'd.	Scr'd.	6	6½	7	8	9	10	10	11	13	14	15
Largest Radius of Balls.....	4	4	5¼	5¼	6¾	6¾	7½	7¾	8	8½	9	10	11	12	14
From centre to Side Flange.....	2¼	2½	3	3¾	4½	4¾	5¼	6	6½	6½	7	7½	8½	10¼	12
From Base to centre of Inlet.....	2¼	2½	3	3½	4	4¼	4¼	5¼	5¾	5¾	6½	7	8	8½	10
Extreme Height.....	14	15	19	23	26	27	31	32	36	37	39	45	46	50	56
From centre to end of Shaft.....	9	9	10	11	12	12	13	14	15	16	17	20	20	21	23
Diameter of Pulley.....	2¼	2½	3	3	5	5	5½	5½	6	6	7	7	7	10	11
Number of Revolutions—A.....	.....	.....	.....	200	175	175	170	170	165	165	165	160	160	135	115
Number of Revolutions—B.....	300	300	250	250	200	200	170	170	175	175	175	150	150	130	110
Corresponding Diam. Engine Cyl'r.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 11	11 to 13	13 to 14	14 to 16	16 to 18	18 to 20	20 to 24	24 to 26	26 to 30

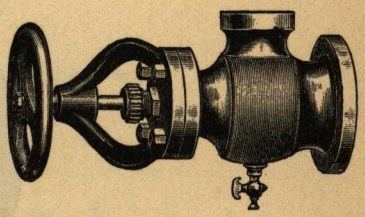
The corresponding Diameter of Engine Cylinder to size of Governor is based on 300 ft. per minute of Piston speed.

THE GARDNER "PERFECTED" GOVERNOR,

FOR STEAM ENGINES.



AUTOMATIC STOP GOVERNOR, WITH ANGLE STOP VALVES ATTACHED.



IMPROVED ANGLE STOP VALVE.

PRICE LIST.

SPRING ADJUSTMENT, WITHOUT AUTOMATIC STOP.

CLASS B.

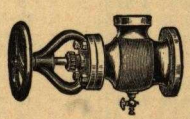
Size	¾	1	1¼	1½	2	2¼	2½	3	3½	4	4½	5	6	7	8
Plain	$16 00	18 00	20 00	23 00	27 00	32 00	36 00	45 00	54 00	64 00	74 00	84 00	110 00	130 00	160 00
Finished	18 00	20 00	23 00	27 00	31 00	37 00	41 00	52 00	62 00	73 00	84 00	96 00	124 00	145 00	176 00

WITH AUTOMATIC STOP ACTION.

CLASS A.

Size	1½	2	2¼	2½	3	3½	4	4½	5	6	7	8	9	10
Plain	$28 00	34 00	39 00	44 00	54 00	65 00	76 00	86 00	99 00	128 00	150 00	185 00	205 00	230 00
Finished	32 00	38 00	44 00	49 00	60 00	73 00	85 00	96 00	110 00	140 00	165 00	200 00	223 00	250 00

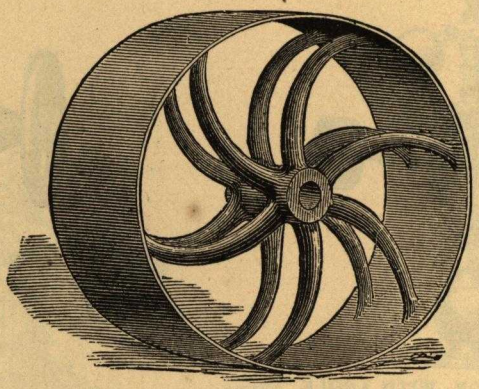
ANGLE STOP VALVE.



Size	1½	2	2¼	2½	3	3½	4	4½	5	6	7	8
Price	$ 7 50	9 00	11 00	12 00	17 00	21 00	25 00	31 00	37 00	50 00	60 00	75 00

In all orders state which class is wanted—whether Plain or Finished, and with or without Angle Stop Valve.
All Governors are COMPLETE with Speeder and Iron Pulleys. No Extras.

CAST-IRON PULLEYS.



PRICE LIST OF PULLEYS.

BORED, TURNED, BALANCED, SET-SCREWED AND PAINTED.

Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.
4	2	$1 60	9	2	$2 50	12	5	$3 75	15	8	$6 03	18	11	$9 07	21	11	$11 20
	3	1 87		3	2 75		6	4 25		9	6 50		12	9 82		12	12 00
	4	2 05		4	3 25		7	4 53		10	7 15					13	12 80
	5	2 40		5	3 25		8	4 90		11	7 73	19	2	4 27		14	13 60
	6	2 70		6	3 50		9	5 33		12	8 27		3	4 60		15	14 66
				7	3 75		10	5 90					4	5 33			
5	2	1 90		8	4 00		11	6 19	16	2	3 75		5	5 76	22	2	5 07
	3	2 15		9	4 30		12	6 67		3	4 00		6	6 66		3	5 33
	4	2 40		10	4 55					4	4 37		7	7 20		4	6 15
	5	2 70		11	4 80	13	2	3 20		5	5 03		8	7 85		5	6 66
	6	2 95		12	5 35		3	3 50		6	5 20		9	8 27		6	7 47
	7	3 25					4	3 75		7	5 81		10	9 07		7	8 27
	8	3 50	10	2	2 70		5	4 00		8	6 40		11	9 60		8	9 07
				3	2 95		6	4 37		9	6 93		12	10 40		9	10 13
6	2	2 00		4	3 20		7	4 80		10	7 73					10	11 20
	3	2 20		5	3 50		8	5 33		11	8 27	20	2	4 53		11	12 00
	4	2 50		6	3 75		9	5 65		12	8 80		3	4 80		12	12 80
	5	2 75		7	4 00		10	6 13					4	5 80		13	13 60
	6	3 00		8	4 25		11	6 67	17	2	3 90		5	6 15		14	14 40
	7	3 20		9	4 55		12	7 20		3	4 16		6	6 95		15	15 47
	8	3 50		10	5 10					4	4 60		7	7 47			
				11	5 60	14	2	3 30		5	5 10		8	8 00	23	2	5 33
7	2	2 15		12	5 90		3	3 58		6	5 55		9	8 53		3	5 80
	3	2 40					4	3 90		7	6 13		10	9 33		4	6 24
	4	2 70	11	2	2 80		5	4 25		8	6 78		11	9 87		5	6 95
	5	2 95		3	3 05		6	4 55		9	7 30		12	10 66		6	7 85
	6	3 25		4	3 30		7	5 10		10	8 00		13	11 47		7	8 53
	7	3 50		5	3 52		8	5 60		11	8 53		14	12 27		8	9 60
	8	3 75		6	3 75		9	6 13		12	9 07		15	13 07		9	10 40
				7	4 16		12	6 67								10	11 20
8	2	2 40		8	4 55		11	7 20	18	2	4 00	21	2	4 80		11	12 27
	3	2 70		9	4 80		12	7 75		3	4 25		3	5 07		12	13 07
	4	2 95		10	5 33					4	4 75		4	5 87		13	13 87
	5	3 25		11	5 60	15	2	3 50		5	5 20		5	6 40		14	14 66
	6	3 50		12	6 13		3	3 68		6	5 90		6	7 20		15	15 73
	7	3 75					4	4 10		7	6 40		7	8 00			
	8	4 00	12	2	2 95		5	4 48		8	7 10		8	8 80	24	2	5 80
	9	4 30		3	3 20		6	4 85		9	7 85		9	9 60		3	5 87
	10	4 55		4	3 50		7	5 33		10	8 43		10	10 40		4	6 40

On Tight and Loose Pulleys, 25 cents extra will be charged for facing long hubs.

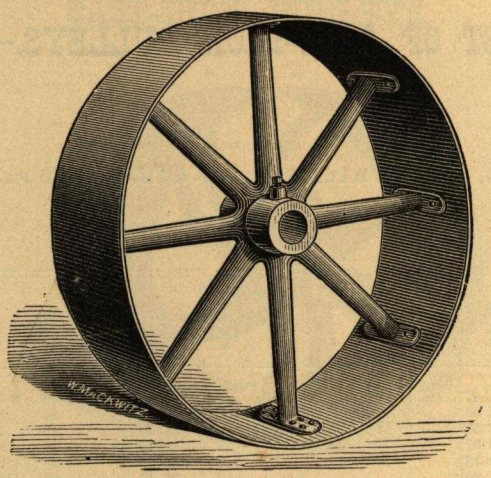
PRICE LIST OF CAST-IRON PULLEYS.—Continued.

BORED, TURNED, BALANCED, SET-SCREWED AND PAINTED.

Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.	Diam.	Face.	Price.
24	5	$ 7 20	28	2	$ 7 47	34	8	$16 53	46	20	$ 58 66	58	12	$ 53 33	68	22	$128 00
	6	8 00		3	8 00		10	19 20					14	61 87		24	142 92
	7	9 07		4	8 53		12	21 90	48	6	22 40		16	70 40			
	8	10 13		5	9 07		14	25 87		8	26 40		18	80 00	70	6	45 87
	9	10 95		6	10 13		16	30 40		10	32 00		20	90 66		8	55 47
	10	11 73		7	11 20					12	38 13		22	102 40		10	64 00
	11	12 53		8	12 27	36	4	12 80		14	44 80		24	113 07		12	83 33
	12	13 35		9	13 35		5	13 60		16	49 87					14	85 33
	13	14 13		10	15 20		6	14 66		18	55 73	60	6	35 20		16	96 53
	14	15 20		11	16 37		8	17 33		20	64 00		8	42 66		18	107 73
	15	16 37		12	17 33		10	20 27		22	74 66		10	49 07		20	121 60
	16	17 33		13	18 13		12	23 47		24	85 33		12	57 60		22	132 00
				14	19 20		14	27 47					14	67 20		24	149 00
25	2	5 87		15	20 27		16	32 27	50	6	24 53		16	76 80			
	3	6 40		16	21 23		18	37 60		8	28 80		18	85 33	72	6	48 00
	4	6 95					20	43 47		10	34 67		20	96 00		8	58 13
	5	7 47	29	2	8 53					12	40 53		22	108 80		10	68 27
	6	8 27		3	9 07	38	6	16 53		14	61 33		24	119 47		12	78 40
	7	9 07		4	9 60		8	19 47		16	55 47					14	89 60
	8	10 40		5	10 40		10	22 93		18	62 40	62	6	37 37		16	100 80
	9	11 73		6	11 73		12	26 40		20	69 33		8	44 80		18	113 60
	10	12 53		7	12 53		14	31 20		22	80 00		10	51 20		20	125 87
	11	13 35		8	13 60		16	35 73		24	90 66		12	59 73		22	138 67
	12	14 13		9	14 66		18	40 00					14	69 33		24	156 80
	13	14 93		10	15 73		20	44 80	52	6	26 67		16	80 00			
	14	16 00		11	16 80					8	32 53		18	90 67	78	10	82 66
	15	17 07		12	17 87	40	6	18 13		10	37 33		20	101 30		12	93 33
	16	18 13		13	18 95		8	20 53		12	42 66		22	112 00		14	104 00
				14	20 27		10	24 00		14	51 47		24	122 61		16	114 67
26	2	6 40		15	21 23		12	28 80		16	57 60					18	126 40
	3	6 95		16	22 40		14	33 87		18	66 13	64	6	39 47		20	137 60
	4	7 47					16	37 60		20	76 26		8	46 66		22	150 93
	5	8 00	30	2	9 07		18	42 13		22	85 33		10	53 33		24	165 33
	6	8 80		3	9 60		20	46 40		24	96 00		12	62 40			
	7	9 60		4	10 13								14	73 07	84	10	97 07
	8	10 66		5	11 20	42	6	19 20	54	6	28 80		16	84 27		12	106 67
	9	12 27		6	12 27		8	22 40		8	36 27		18	94 93		14	117 33
	10	13 25		7	13 35		10	26 13		10	40 53		20	106 67		16	128 00
	11	14 13		8	14 40		12	30 70		12	45 87		22	117 33		18	138 67
	12	15 20		9	15 47		14	35 73		14	54 93		24	128 00		20	149 00
	13	16 00		10	16 53		16	42 13		16	61 33					22	160 00
	14	16 80		11	17 60		18	46 93		18	72 53	66	6	41 60		24	170 66
	15	17 60		12	18 66		20	51 75		20	82 66		8	50 13			
	16	18 66		13	20 00					22	92 26		10	57 60	90	10	113 07
				14	21 23	44	6	20 27		24	101 33		12	66 66		12	124 80
27	2	6 95		15	23 47		8	23 73					14	77 87		14	135 47
	3	7 47		16	25 07		10	28 27	56	6	30 93		16	88 53		16	146 13
	4	8 00					12	33 07		8	38 93		18	99 20		18	156 80
	5	8 53	32	4	11 20		14	38 13		10	42 63		20	112 00		20	167 47
	6	9 60		5	12 00		16	43 47		12	49 07		22	122 66		22	178 13
	7	10 66		6	13 07		18	48 80		14	57 60		24	136 50		24	188 80
	8	11 73		8	15 47		20	55 73		16	65 07						
	9	12 80		10	17 60					18	74 66	68	6	43 73	96	10	133 60
	10	14 40		12	19 73	46	6	21 23		20	85 33		8	52 80		12	144 00
	11	15 20		14	23 47		8	24 80		22	96 00		10	60 80		14	152 67
	12	16 00		16	26 67		10	29 87		24	106 66		12	69 87		16	165 33
	13	16 80					12	35 47					14	81 07		18	176 00
	14	17 60	34	4	12 00		14	41 60	58	6	33 07		16	92 27		20	186 66
	15	18 66		5	12 80		16	48 27		8	41 07		18	103 47		22	197 33
	16	19 73		6	13 87		18	53 33		10	45 33		20	117 33		24	208 00

Pulleys in Halves and Flange Pulleys at an advance of 25 per cent. on the above list. Double-Armed and Cone Pulleys to order.

MEDART'S COLD ROLLED WROUGHT METAL RIM PULLEYS.



PRICE LIST OF MEDART'S PATENT WROUGHT IRON RIM PULLEYS.

Width of Face, inches.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Diameter 9 in.	2 50	2 65	2 90	3 15	3 28	3 40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Diameter 10 in.	2 60	2 75	3 00	3 25	3 40	3 55	3 72	3 90	.....	.....	.....	.....	.....	.....	.....	.....
Diameter 11 in.	2 70	2 85	3 10	3 35	3 53	3 70	3 90	4 10	.....	.....	.....	.....	.....	.....	.....	.....
Diameter 12 in.	2 80	2 95	3 20	3 55	3 70	3 85	4 08	4 30	4 70	5 10	.....	.....	.....	.....	.....	.....
Diameter 13 in.	2 90	3 10	3 40	3 75	4 00	4 25	4 53	4 80	5 20	5 60	.....	.....	.....	.....	.....	.....
Diameter 14 in.	3 00	3 25	3 65	4 10	4 40	4 70	5 02	5 35	5 68	6 00	6 30	6 60	.....	.....	.....	.....
Diameter 15 in.	3 10	3 45	3 85	4 35	4 75	5 10	5 48	5 85	6 18	6 50	6 85	7 20	.....	.....	.....	.....
Diameter 16 in.	3 30	3 65	4 05	4 60	5 05	5 50	5 90	6 30	6 65	7 00	7 35	7 70	8 35	.....	.....	.....
Diameter 17 in.	3 50	3 85	4 25	4 85	5 35	5 85	6 30	6 70	7 10	7 50	7 88	8 25	9 05	.....	.....	.....
Diameter 18 in.	3 70	4 05	4 55	5 10	5 65	6 20	6 65	7 10	7 55	8 00	8 50	9 00	9 80	.....	.....	.....
Diameter 19 in.	.....	4 25	4 80	5 50	6 13	6 75	7 15	7 50	8 05	8 60	9 20	9 80	10 70	.....	.....	.....
Diameter 20 in.	.....	4 45	5 20	6 00	6 60	7 15	7 60	8 00	8 75	9 50	10 25	11 00	11 80	12 60	.....	.....
Diameter 21 in.	.....	4 70	5 60	6 40	6 95	7 50	8 10	8 65	9 55	10 40	11 20	12 00	12 85	13 70	.....	.....
Diameter 22 in.	.....	4 95	5 90	6 85	7 45	8 00	8 70	9 40	10 30	11 20	12 10	13 00	13 60	14 20	.....	.....
Diameter 23 in.	.....	5 20	6 15	7 05	7 70	8 40	9 20	9 95	11 05	12 00	13 00	14 00	15 10	16 20	.....	.....
Diameter 24 in.	.....	5 40	6 35	7 30	8 05	8 80	9 65	10 45	11 55	12 70	13 90	15 10	16 30	17 50	18 75	20 00
Diameter 25 in.	.....	5 80	6 65	7 60	8 40	9 20	9 95	10 90	12 15	13 40	14 80	16 25	17 70	19 10	20 55	22 00
Diameter 26 in.	.....	6 35	7 00	7 95	8 80	9 60	10 05	11 40	12 80	14 20	15 85	17 50	19 15	20 80	22 45	24 10
Diameter 28 in.	.....	7 20	7 80	8 60	9 45	10 30	11 20	12 10	13 70	15 25	17 10	19 00	21 00	23 00	24 95	26 90
Diameter 30 in.	.....	8 00	8 60	9 40	10 45	11 50	12 40	13 25	14 90	16 50	18 75	21 00	23 20	25 40	27 70	30 00
Diameter 32 in.	.....	8 80	9 40	10 30	11 60	12 90	13 95	15 00	16 45	17 90	20 30	22 75	25 25	27 75	30 00	32 25
Diameter 34 in.	.....	9 60	10 50	11 50	13 00	14 50	15 75	17 00	18 50	20 00	22 50	24 50	27 25	30 00	32 25	34 50
Diameter 36 in.	.....	10 60	11 90	13 00	14 50	16 00	17 55	19 10	20 80	22 50	24 50	26 50	29 45	32 40	34 70	37 00
Diameter 38 in.	.....	.....	.....	14 50	16 05	17 60	19 15	20 70	22 70	24 75	26 60	28 50	31 50	34 50	36 90	39 25
Diameter 40 in.	.....	.....	.....	16 00	17 50	19 00	20 75	22 50	24 65	26 75	28 85	31 00	33 65	36 25	38 85	41 50
Diameter 42 in.	.....	.....	.....	17 50	19 50	21 50	23 25	25 00	27 00	29 00	31 25	33 50	36 00	38 50	41 10	43 75
Diameter 44 in.	.....	.....	.....	19 50	21 65	23 75	25 65	27 50	29 50	31 50	33 75	36 00	38 40	40 75	43 35	46 00
Diameter 46 in.	.....	.....	.....	22 00	24 00	26 00	28 00	30 00	31 75	33 50	36 00	38 50	40 75	43 00	45 50	48 00
Diameter 48 in.	.....	.....	.....	24 50	26 25	28 00	30 50	32 50	34 25	36 00	38 50	41 00	43 00	45 00	47 50	50 00

WROUGHT IRON TURNED SHAFTING.

Diameter.	Per Foot.
1 3-16 inch	$0 45
1 7-16 "	0 55
1 11-16 "	0 70
1 15-16 "	0 85
2 3-16 "	1 05
2 7-16 "	1 30

Diameter.	Per Foot.
2 11-16 inch	$1 50
2 15-16 "	1 85
3 3-16 "	2 15
3 7-16 "	2 55
3 15-16 "	3 75

Short Shafts and Key Seats extra.

FLAT BOXES.

Diameter.	Length of Box.	Per Box.
15-16 inch	3¾ inch.	$1 53
1 3-16 "	3½ "	1 90
1 7-16 "	4 "	2 25
1 11-16 "	6 "	3 20
1 15-16 "	7 "	3 95
2 3-16 "	7¾ "	4 50

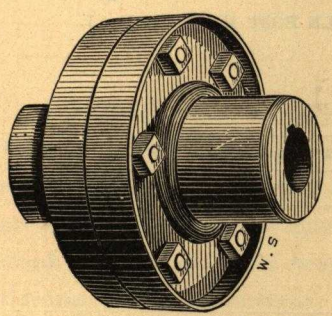
Diameter.	Length of Box.	Per Box.
2 7-16 inch	8¾ inch.	$5 71
2 11-16 "	9 "	6 45
2 15-16 "	9 "	7 00
3 7-16 "	10 "	9 80
3 15-16 "	11 "	12 50

FINISHED SLIP COLLARS, with Set Screws.

Size of Shafting.	Each.
1 3-16 inch	$1 10
1 7-16 "	1 35
1 11-16 "	1 54
1 15-16 "	1 80
2 3-16 "	2 00
2 7-16 "	2 20

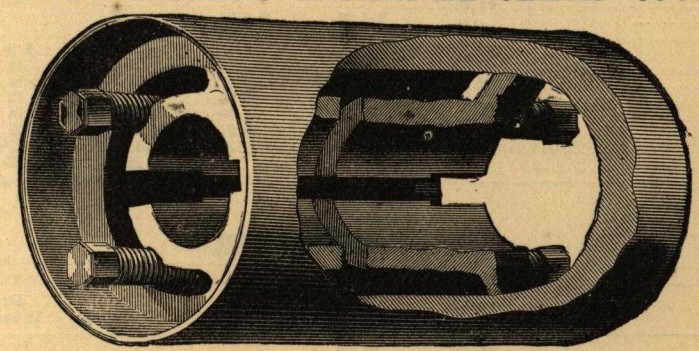
Size of Shafting.	Each.
2 11-16 inch	$2 40
2 15-16 "	2 60
3 3-16 "	2 80
3 7-16 "	3 00
3 11-16 "	3 30
3 15-16 "	3 50

FINISHED PULLEY COUPLINGS.



Size of Shafting.	Price.
1 3-16 inch	$ 5 50
1 7-16 "	6 00
1 11-16 "	7 00
1 15-16 "	8 00
2 3-16 "	9 00
2 7-16 "	10 00
2 11-16 "	11 00
2 15-16 "	13 00
3 3-16 "	15 00
3 7-16 "	18 00
3 11-16 "	22 00
3 15-16 "	25 00
4 3-16 "	30 00
4 7-16 "	35 00
4 15-16 "	48 00

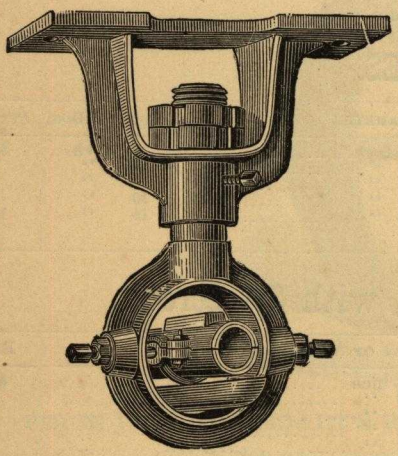
CHARLTON'S PATENT INTERNAL CLAMP COUPLING.



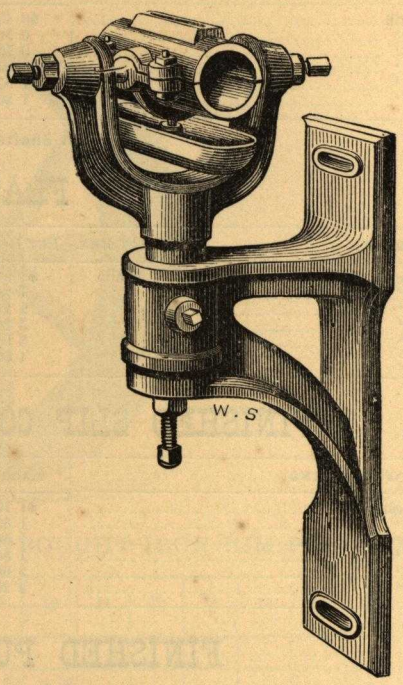
Size.	Per Piece.
1 3-16 inch	$ 4 25
1 7-16 "	5 00
1 11-16 "	6 00
1 15-16 "	8 00
2 3-16 "	8 75
2 7-16 "	10 75
2 11-16 "	13 00
2 15-16 "	16 50

Size.	Per Piece.
3 3-16 inch	$20 00
3 7-16 "	23 00
3 15-16 "	29 00
4 7-16 "	40 00
4 15-16 "	50 50
5 7-16 "	60 00
5 15-16 "	72 00

HANGERS.



ADJUSTABLE DROP HAMMER.



ADJUSTABLE POST HANGER, No. 1.

ADJUSTABLE POST HANGER, No. 1.

Size	1 7-16	1 11-16	1 15-16	2 3-16	2 7-16	2 11-16	2 15-16	3 3-16	3 7-16	3 15-16
Price	$5 77	7 29	8 87	9 45	10 67	11 79	13 19	15 17	16 56	20 79

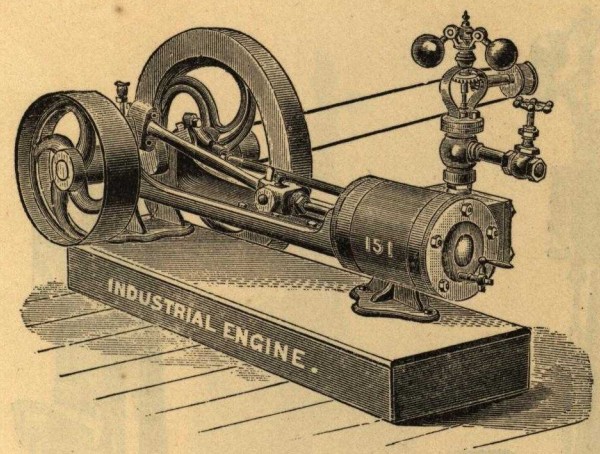
ADJUSTABLE DROP HANGER.

Size of Journal.	Drop, 12 inches.	Drop, 13 inches.	Drop, 16 inches.	Drop, 19 inches.	Drop, 22 inches.	Drop, 25 inches.
1 3-16 inch	$4 16	....	....	....	....	....
1 7-16 "	....	$ 5 39	$ 5 99	....	....	....
1 11-16 "	....	6 35	7 25	....	....	....
1 15-16 "	....	7 66	8 35	$ 9 09	$ 9 90	....
2 3-16 "	....	9 09	9 54	10 67	11 48	....
2 7-16 "	....	10 26	10 67	11 75	12 60	$13 50
2 11-16 "	....	11 39	12 20	13 37	13 73	14 75
2 15-16 "	....	12 51	13 50	14 22	14 94	15 93
3 3-16 "	....	....	16 07	16 50	17 10	17 69
3 7-16 "	....	....	....	17 24	17 91	18 77
3 15-16 "	....	....	....	22 59	23 22	....

RIGID DROP HANGER.

Size of Journal.	Drop, 10 inches.	Drop, 12 inches.	Drop, 14 inches.	Drop, 16 inches.	Drop, 18 inches.	Drop, 20 inches.
15-16 inch	$4 55	$4 70	....	....	....	....
1 3-16 "	4 60	4 75	....	....	....	....
1 5-16 "	4 90	5 15	$5 35	....	....	....
1 7-16 "	4 98	5 35	5 45	....	....	....
1 11-16 "	5 40	5 55	5 80	$5 95	$ 6 25	....
1 15-16 "	....	7 25	7 55	7 85	9 85	$10 45
2 3-16 "	....	....	8 40	8 75	10 10	10 85
2 7-16 "	....	8 00	8 85	9 15	10 55	11 60
2 11-16 "	....	....	9 15	9 45	10 75	11 75
2 15-16 "	....	....	11 45	11 75	12 50	13 75

THE INDUSTRIAL ENGINE.



DESCRIPTION.

For effectiveness, simplicity, durability and economy, we can safely recommend the above Engine. All the working parts are placed so they can be easily got at, to take up any slack motion when parts become worn. All the metal is placed where it is most needed, thus preventing all liability of breakage. Material used is of the best quality. Wrought iron forged crank and pitman, brass boxes, steel piston and valve stem, self-adjusting cylinder packing, Gardner or Judson governor. Workmanship warranted first class in every particular.

DIMENSIONS AND PRICE.

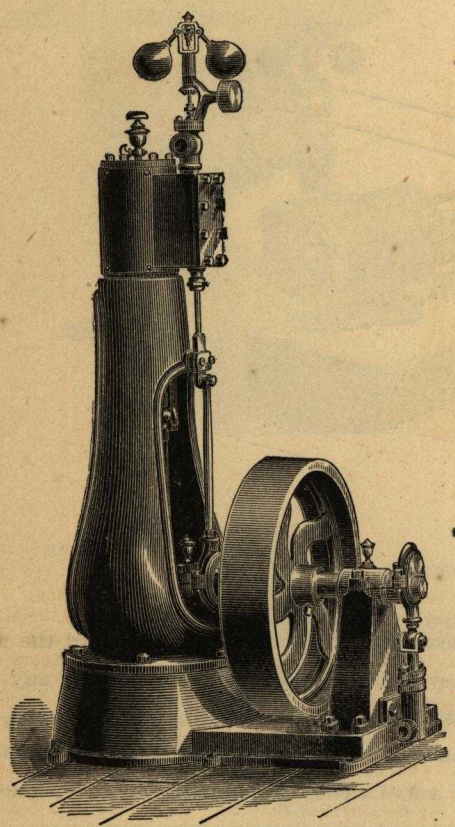
Cylinder, 4x6; revolutions per minute, 250; pulley, 12 inch diameter, 5-inch face; weight, 300 pounds; 4-horse power.

Price, complete, as above	$125 00

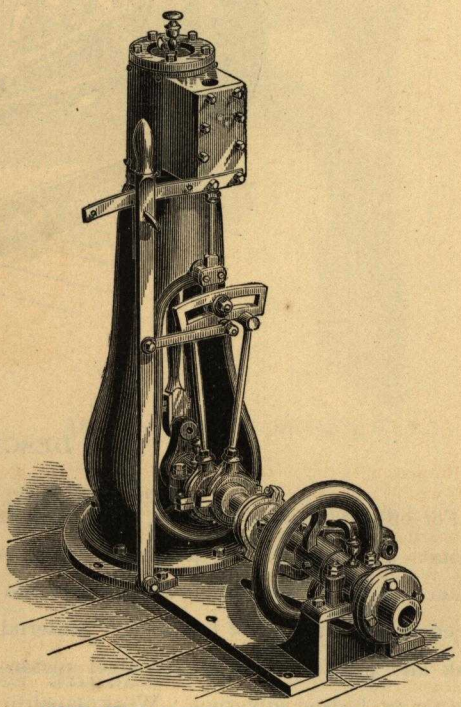
Can furnish upright Engines at same prices.

Larger Engines can be furnished, if desired. Write for prices.

IMPROVED VERTICAL ENGINES.



IMPROVED VERTICAL ENGINE.

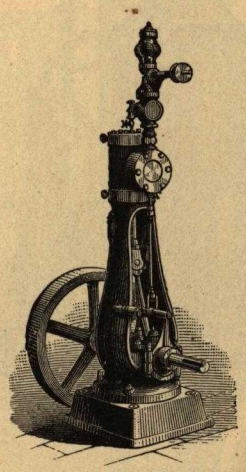


IMPROVED VERTICAL YACHT ENGINE.

The frame is a tapering column of graceful outline, having liberal openings in the sides to allow free access to all the working parts; the slides are cast with the column, and, therefore, cannot become loose or out of line. The base is made in one piece, and is so constructed as to admit of belting from fly-wheel in any direction. A pump may be connected to the pillow-block and driven by a cam on the main shaft, when desired. No extra charge for boxing and delivering on board in St. Louis, Mo.

Horse Power.	CYLINDER.		FLY-WHEEL.			Revolutions per minute.	PRICE.		
	Diam.	Stroke.	Diam.	Face.	Weight.		Engine.	Engine and Pump.	Yacht Engine with Shafts, Screws, Bearing and Bolts, Comp.
2	3	5	15½	3	49 lbs.	300	.....	$125 00	$140 00
4	4	6	19	5	95 lbs.	250	.....	170 00	190 00
6	5	7	22	6	120 lbs.	210	.....	230 00	250 00
8	6	8	25	7	170 lbs.	190	.....	310 00	330 00
12	8	10	36	9	250 lbs.	175	$350 00	.....	420 00
20	10	12	42	12	300 lbs.	130	450 00	.....	525 00

INDEPENDENT VERTICAL ENGINE.



The accompanying engraving represents our very popular Independent or Double-Crank Vertical Engine.

It will be understood that there are two bearings for the crank shaft, both being cast solid with the column, as are also the cross-head slides. There can be in consequence no derangement of lines and no unequal pressure of parts. The bearings are long, and the shafts of large diameter, giving both large area of bearings and strength in excess of any reasonable duty. The main valve is of the plain slide description. The piston rod, valve rod, cross-head pin, etc., are of steel; the crank-pin box is of composition, babbitted; the cross-head pin box is of brass. Drain-cocks are connected to both ends of the cylinder, leading condensation into the base, where all drippings are accumulated and thence carried away by a pipe connection.

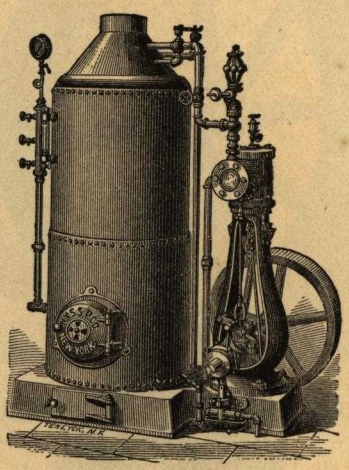
A critical steam test of every engine is made before it leaves our shop, and the necessary adjustments are carefully made, so that the machine is all ready to run the moment it is placed in position and given steam. In operation they are NOISELESS. Their durability is best attested by the fact that many of them have been at work for TEN YEARS, giving utmost satisfaction to their owners, and having cost little or nothing for repairs. TWELVE HUNDRED ENGINES of our manufacture are in use, and whenever desired, reference will be made to a great number of either of the several sizes which we make.

Horse-Power.	Size of Cylinder. Dia. Str'ke	Revolutions Per Minute.	Diameter of Shaft.	Size of Wheel. Dia. Face.	Weight of Wheel.	Total Weight of Engine, with Wheel.	Size of Steam Pipe.	Size of Exhaust Pipe	Space Occupied on Floor.	Height of Centre of Shaft from Floor.	Height from Floor to Top of Cylinder.	Height to Top of Regulator.	Price	Horse-Power.
	In. In.		Inches.	In. In.	Lbs.	Lbs.	In.	In.	Ft. In. Ft. In.	Ft. In.	Ft. In.	Ft. In.		
2	3 x 5	250	1 12-16	20x3	85	342	¾	¾	1 8 x 2	1	3 5½	4 9	$140	2
3	3½ x 5	250	1 12-16	20x4	110	367	¾	¾	1 8 x 2	1	3 5½	4 9	160	3
4	4 x 6	200	1 15-16	24x4	165	522	1	1	2 x 2 8	1 2	4 3	5 11	200	4
5	5 x 6	200	1 15-16	24x5	200	557	1	1¼	2 x 2 8	1 2	4 3	5 11	220	5
6	5½ x 7	180	2 7-16	32x4½	332	889	1¼	1¼	2 6 x 2 10	1 5½	4 11½	6 4	260	6
8	6½ x 7	180	2 12-16	32x6	420	977	1¼	1½	2 6 x 2 10	1 5½	4 11½	6 4	280	8
10	7 x 9	160	2 15-16	42x7½	565	1,750	1½	1½	3 6 x 3 10	2	6 4	7 6	325	10
12	8 x 9	160	2 15-16	42x9	680	1,865	1½	2	3 6 x 3 10	2	6 4	7 6	375	12

Each Engine is fitted with Governor, Stop-Valve, Cylinder Oil Cock, Drip Cocks, full set of Oil Cups and Wrenches. Prices above 50 H. P. quoted on application.

COMBINED VERTICAL ENGINE AND BOILER.

(SEMI-PORTABLE.)



This is a complete, compact and convenient combination.

It embraces the engine, boiler, pump and heater upon a single cast-iron base—the whole being completely piped and ready for immediate service.

The engine IS NOT FASTENED TO OR UPON THE BOILER, and is not, therefore, affected by the expansion, nor are the bearings overheated by conduction or the ascending heat from the boiler.

The HEATER, by which the heat of the exhaust steam is imparted to the feed water on its way to the boiler (saving fully 10 per cent. of the fuel, and much in wear and tear of the boiler), is contained in the base, beneath the engine. Although out of sight, it is readily accessible.

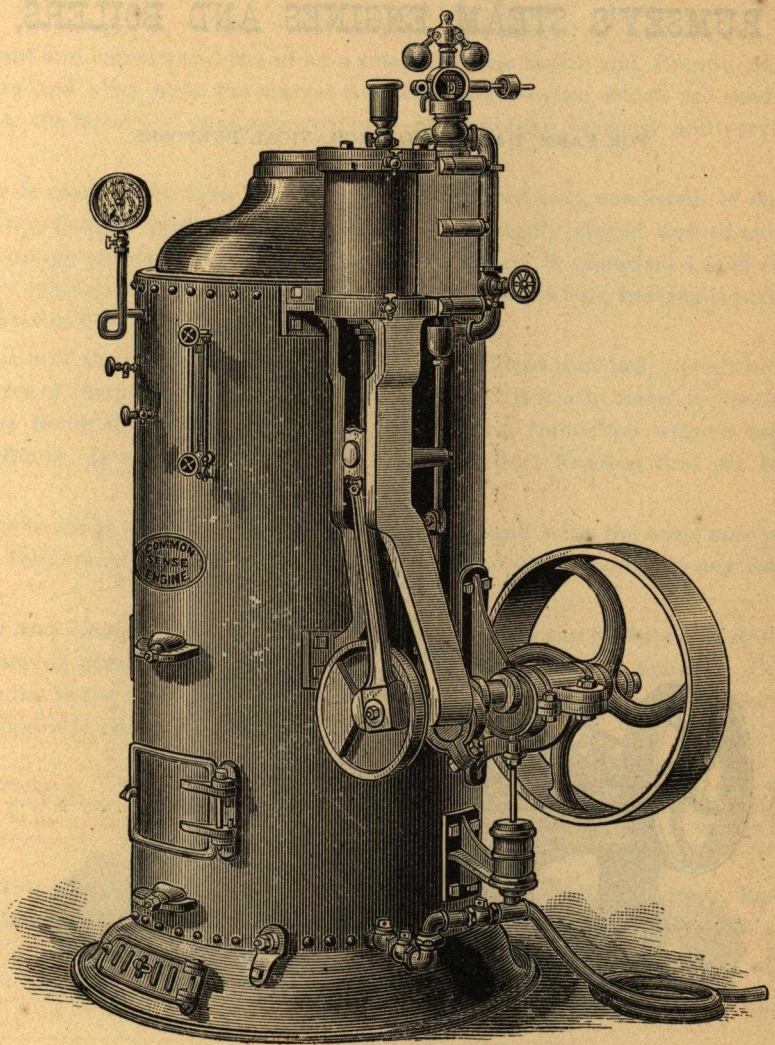
The FEED PUMP is affixed to the base below the engine, and is driven by an eccentric on the crank shaft.

All parts are easy of access for adjustment or repairs. Any part of the machinery which by accident becomes broken or by age worn out, can be replaced without loss of time and at slight expense, on application to us, as all parts are made interchangeable and are always in stock ready for delivery.

PRICE LIST OF COMBINED VERTICAL ENGINES AND BOILERS.

Horse-Power.	ENGINE.					BOILER.						COMBINED ENGINE AND BOILER.				Price, Engine and Boiler, Complete.
	Diameter.	Stroke.	Revolutions, per Minute.	WHEEL.		Diameter.	Height.	TUBES.			Heating Surface.	Space Occupied on Floor.	Height to Top of Boiler.	Height to Top of Smoke Bonnet.	Total Weight of Engine and Boiler.	
				Diameter.	Face.			No.	Diameter.	Length.						
	In.	In.		In.	In.	In.	In.		In.	In	Sq. Ft.	Ft. In. Ft. In.	Ft. In.	Ft. In.	Lbs.	
2	3	5	250	20	3	22	53	18	2	30	32	3 6 x 2 3	4 9	6 7	1,021	$340 00
3	3½	5	250	20	4	24	68	18	2	40	43	3 6 x 2 3	5 9	7 5	1,132	380 00
4	4	6	200	24	4	26	69	30	2	40	64	4 2 x 2 6	5 7	7 9	1,319	440 00
5	5	6	200	24	5	28	69	36	2	40	75	4 2 x 2 6	6 7	8 9	1,509	480 00
6	5½	7	180	32	4½	30	74	36	2	46	86	5 2 x 2 10	6 2	8 6	2,222	540 00
8	6½	7	180	32	6	32	74	54	2	46	121	5 2 x 2 10	7 2	9 6	2,470	580 00
10	7	9	160	42	7½	35	80	60	2	48	145	6 5 x 3 6	7 3	10 6	4,783	665 00
12	8	9	160	42	9	38	82	78	2	48	183	6 5 x 3 6	10 7	11 6	5,500	765 00

COMMON SENSE PORTABLE ENGINE.



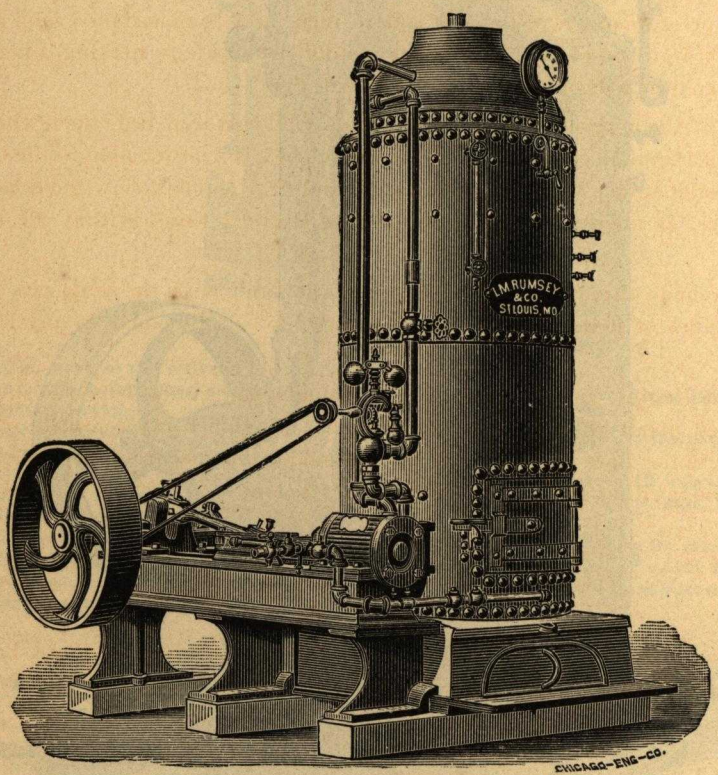
DIMENSIONS AND PRICES.

ENGINE.				BOILER.					
Horse Power.	Size Cylinder.	Revolutions.	Pulley.	Diameter.	Height of Boiler.	Height of Boiler & Base.	Floor Space.	Shipping Weight.	Price.
3	4 x 4	250	16 x 6	25	48	54	37	1,000	$275 00
5	5 x 5	240	24 x 6	29	56	64	48	1,400	300 00
7	6 x 8	200	30 x 6½	32	66	74	60	2,000	375 00
10	8 x 8	200	30 x 8	35	74	82	70	2,600	500 00

We charge $3.00, $5.00, $7.00 and $8.00 extra for boxing. When the following Extras are desired, we furnish Whistle at $6.00; Spark Arrester at $5.00; Extra Smoke Stack, 85 cents per foot.

RUMSEY'S STEAM ENGINES AND BOILERS,

FOR FARM, DAIRY AND MECHANICAL PURPOSES.



DESCRIPTION.

The above cut represents our 6-horse Power Portable Boiler and Engine, for Farmers' use, for shelling corn, grinding grain, cutting fodder, sawing wood and cooking feed; and for use in Dairies, Small Shops, Steam Laundries, and for any other purpose requiring from one to six horse power.

RUMSEY'S PORTABLE BOILER AND ENGINE.

The constant and increasing demand for a small Portable Boiler and Engine has induced us to manufacture and place upon the market this Boiler and Engine, which are made of the best material, and in the latest and most approved style of durability, economy and service. See cut on page 432.

The Boiler is made of the best No. 1 Charcoal Hammered Iron, one-fourth of an inch thick, with wrought iron flanged heads, $\frac{3}{8}$ inch thick, and is thoroughly stayed and of ample strength to sustain a steam pressure of 150 pounds per square inch, and is placed on a solid cast iron base having a heavy cast-iron bed-plate 36x42 inches resting on short legs, making it perfectly safe to stand upon a wooden floor without danger from ashes or fire.

The Engine is of the horizontal form, made with a solid cast-iron bed, upon which rests both the journal boxes of the main crank shaft. The Engine bed is firmly bolted to the cast iron base upon which the Boiler stands, thus giving it a solid and firm foundation without any chance for injury to the Boiler, as always occurs in the case of Vertical Engines that are bolted to the boiler shell.

The Engine is made throughout of the best material, and with the same care and nicety of adjustment as Engines of 40-horse power, and warranted to be fully equal to any Engine offered on the market.

The Boiler and Engine complete weigh 2,700 pounds, and can be bolted to skids or wooden runners and moved about on a farm as desired. The Engine being complete of itself can be detached from the Boiler Base and placed at any reasonable distance from the Boiler and used as a Stationary Engine in either a horizontal or vertical position.

Boiler.	Diameter.	High.	Tubes.	Diam.	Length.	Square Feet.	Weight.
	30 in.	72 in.	42	2	54 in.	96	1,900 pounds.

Fire Box, 25 inches diameter, 18 inches high, two hand holes, with Bed Plate, Base, Dumping Grate, Smoke Bonnet, Steam Gauge, Glass Water Gauge, Safety Valve, 3 Try Cocks and Blow-off Cock.

Price	$200 00

6-Horse Power Engine Cylinder 5x7, Bed is 56 inches long by 14 inches wide, Band Wheel 24 inches diameter and five inches face, and weighs, with legs or standards, 800 pounds.

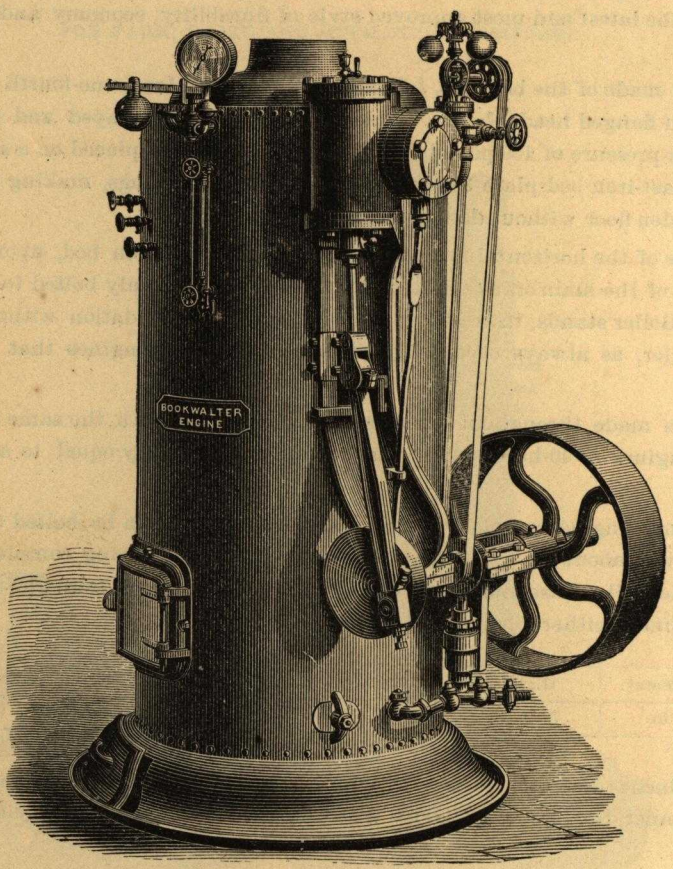
Price of Engine, complete with Standards, Band Wheel, Governor and Pump	$200 00
Price of 6-Horse Power Engine and Boiler, complete	400 00

12-Horse Power Engine, cylinder 8x10 complete, with Fly Wheel 48 in. diam., 7 in. face, turned for Band Wheel, Governor $1\frac{1}{2}$ inch, Bed 6 feet long 18 inches wide, $6\frac{1}{2}$ inches high, weight 1,700 lbs.

Price of 12-Horse Power Engine, without Boiler	$330 00

Boiler for same, special price.

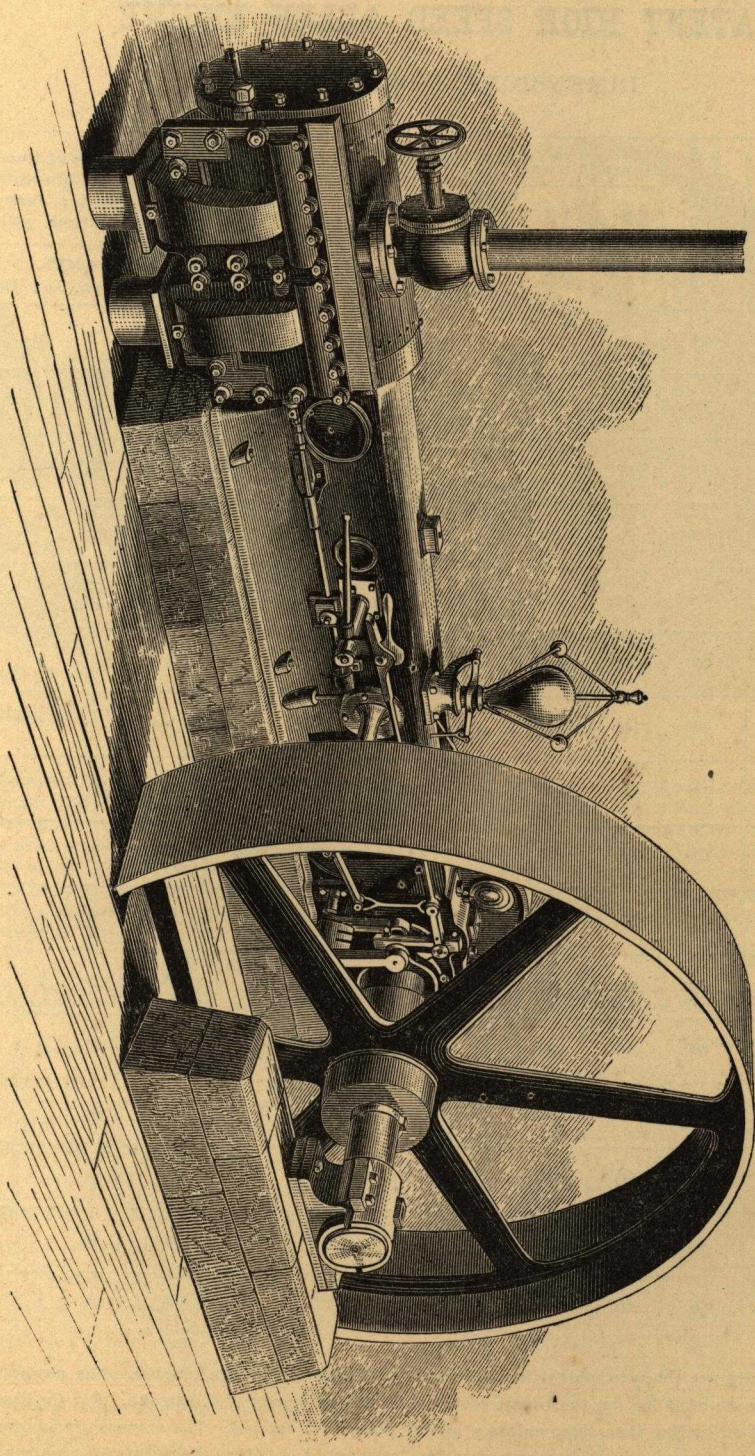
BOOKWALTER PORTABLE ENGINE.



DIMENSIONS AND PRICES OF ENGINE AND BOILER COMPLETE,

AS SHOWN IN THE ABOVE CUT.

Horse Power.	Size of Cylinder, Inches.	Size of Pulley, Inches.	Revolutions.	Height, Inches.	Floor Space, Inches.	Weight.	Price Engine and Boiler at Works.
3	3½ x 6	21 x 6	240	59	39	1,300	$ 240 00
4½	4½ x 7	21 x 6	240	68	39	1,700	280 00
6½	5 x 8	24 x 7	220	77	43	2,300	355 00
8½	4½ x 12	31 x 7	200	82	45	2,550	440 00



THE PATENT HIGH SPEED ALLEN STATIONARY ENGINE.

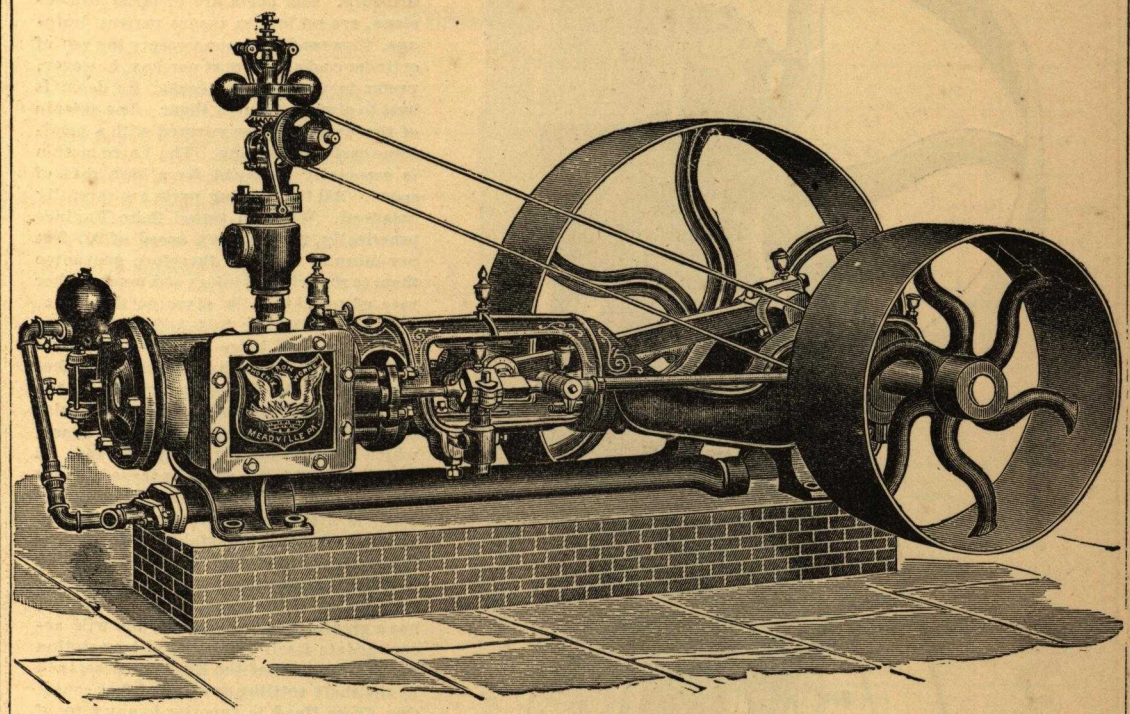
PATENT HIGH SPEED ALLEN ENGINE,

DIMENSIONS, POWERS, ETC.

DIMENSIONS OF CYLINDERS.		Revolutions of Crank per minute.	Travel of Piston in feet per minute.	INDICATED HORSE POWER.		FLY-WHEELS. Made, when Practicable, to Serve also as Belt-Drums.		DRIVING BELTS.			Size of Quadrangle within which each Engine, including Fly Wheel, will stand.	
				Without Condensation.	With Condensation.	Diameter, Feet.	Weight of Rim, Pounds	Velocity in Feet per Minute.	Width Required for Non-Condensing Engines, inches.	Width Required for Condensing Engines, inches.	Length, Feet. In.	Width, Feet. In.
Bore, inches.	Stroke, inches.											
8	14	260	600	36	48	4	750	3,266	Double. 6	Double. 7	9 9	5 8
9	14	260	600	46	61	4	750	3,266	7	8.5	10 3	6
10	16	225	600	57	76	5	1,200	3,563	8.5	10	12 6	7 4
11	16	225	600	70	93	5	1,200	3,563	10	12	13	8
13	20	180	600	94	125	6	2,650	3,390	12.5	17	15	8 6
14	20	180	600	112	150	7	2,650	3,957	16	20	15 6	9
16	24	150	600	146	195	8	3,933	3,770	20	24	18 8	10
18	24	150	600	186	250	9	3,933	4,240	22.5	30	19 4	10 6
20	30	120	600	230	306	10	7,680	3,770	27.5	37	22 6	12
22	30	120	600	276	370	11	7,680	4,146	35	44	23 3	12 6
24	36	100	600	329	432	12	13,000	3,770	Triple. 26	Triple. 35	26 6	14 6
26	36	100	600	386	514	13	13,000	4,082	30	40	27 3	16
28	42	86	600	447	596	14	20,000	3,791	36	48	31	18
32	42	86	600	585	780	15	20,000	4,051	48	56	39	17
36	48	75	600	740	986	16	24,000	3,770	60	78	40	18
40	48	75	600	944	1,258	16	24,000	3,770	75	100	41 8	18

The speeds given above are those to which the engines, as ordinarily made, are adapted. The powers are those given by an initial pressure of 80 lbs. on the square inch, cut off at one-quarter of the stroke. For the best economy steam should not be cut off earlier than this, unless a higher pressure is carried. The engines are adapted to work under locomotive pressure, if required. The governor varies the point of cut off as the resistance requires, from the commencement up to the middle of the stroke, without sensible change in the speed of the engine. At the latter point of cut off, the powers developed are 50 per cent. greater than those given in the above table When still greater power is liable to be occasionally called for, the steam is permitted to follow the piston to a later point in the stroke.

PHŒNIX DETACHED PORTABLE ENGINE.



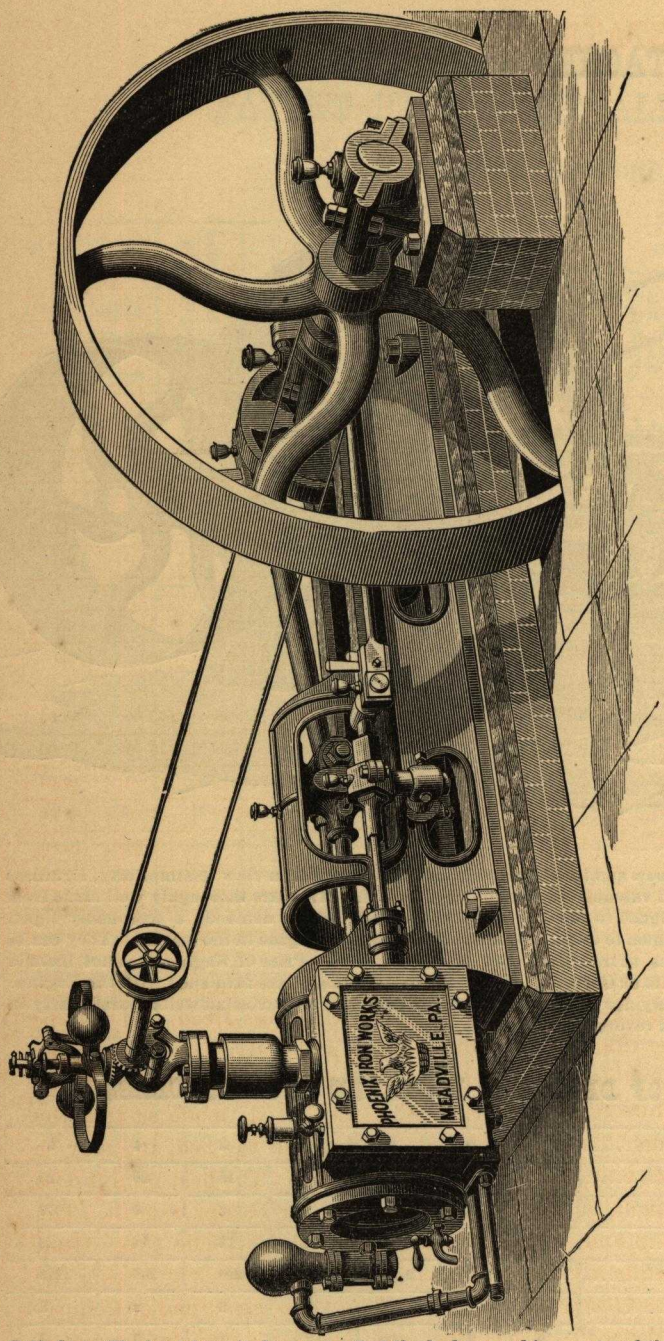
These Engines are built from entirely new and improved patterns, designed with a view to simplicity, lightness and strength, and they embody many new and valuable ideas and improvements. They are thoroughly well made from first-class materials, and are especially designed to meet the wants of a trade which demands a reasonably light, compact and durable Engine. We guarantee them to do fully as much service as any Engine in the market. They can be connected to any style of Boiler. All Engines thoroughly tested before shipment. Price of Engine does not include any Steam or Exhaust Pipes, Foundation Bolts or Governor Belt. All Brass Fittings are furnished with the Engine. This Engine, with reversing link, is extensively used for hoisting, boring and operating artesian wells, particularly in the Oil Regions, and other uses when frequent reversing is required.

DIMENSIONS AND PRICES OF DETACHED PORTABLE ENGINES, CLASS B.

Number of Size	00	0	1	2	3	4	5
Horse Power	6	8	10	12	15	20	25
Diameter of Cylinder, in inches	5	6	7	8	8	9	10
Length of Stroke, in inches	8	8	10	10	12	12	12
Usual Number of Revolutions	250	250	2.5	225	200	200	200
Diameter of Steam Pipe, in inches	1¼	1¼	1½	2	2	2	2½
Diameter of Exhaust Pipe, in inches	2	2	2½	2½	3	3	3
Diameter of Pulleys, in inches	16-36	16-36	20-44	20-44	32- 8	32-48	32-54
Face of Pulleys, in inches	8-10	8-10	8-10	8-10	8-12	8-12	8-12
Diameter of Shaft, in inches	2⅜	2⅜	3¾	2¾	3	3¼	3½
Length between centres of Foundation Bolt Holes	51	51	58	58	63	68	68
Width between centres of Foundation Bolt Holes	12	12	13	13	14	14	14
Estimated Weight	1,050	1,200	1,700	1,800	2,100	2,200	2,300
Price of Engine, complete, on Board of Cars			$260 00	281 00	328 00	358 00	401 00

PHŒNIX STATIONARY ENGINE, CLASS A.

DESCRIPTION.



These Engines are built from entirely new and improved patterns, are remarkably compact, strong, simple in construction and of the best materials and workmanship. The ports are of large dimensions, are set low to insure perfect drainage, thus rendering unnecessary the use of cylinder cocks. As most persons, however, prefer to use cylinder cocks, we deem it best to always furnish them. The outside of the Cylinders are covered with a handsome cast-iron lagging. The Valve motion is especially designed for a high rate of speed. All the running parts are carefully balanced. We have tested these Engines practically, running at a speed of 800 feet per minute, and can therefore guarantee them to run without injury at a much higher rate of speed than is given in the table. We use the Dunbar Self-Adjusting Steam Packing in all of these Engines. The form of construction is such as to ensure perfect alignment. The Guides are made in the strongest possible form, and being cast with the bed form a strong cylindrical brace, which strengthens and stiffens the bed. It makes no difference whether these Engines are run over or under stroke. The Cross-Head is fitted with heavy brass Gibs, top and bottom, made adjustable, with a wearing surface of 5 x 8 inches. This Cross-Head is a great improvement on the old style of Locomotive Cross-Head, as it is stronger, has a greater wearing surface, and will accommodate itself to any slight variation in the alignment of the Engine, occasioned by the shaft settling or by any other cause. Our Cross-Head is superior to any form of Cross-Head used on any other make of Engine. For full description of Cross-Head, see cut and explanation on page 438. The Cross-Head Wrist Pin is made of steel-turned taper, with a brass nut on each end to take up the wear. The Connection Rod at Cross-Head end is round and fitted with a taper brass bushing. The Crank end of Connection Rod is fitted with Gib and Key. The Shafts are made of hammered iron; the Wrist Pins, Piston and Valve Rods of steel. The Pump is fastened to the Cylinder, is driven by the Cross-Head and may be disconnected or taken off entirely in one minute. The Seats and Valves are brass. The Heater is fastened to the bottom of the Cylinder, and extends back through the centre of the bed as far as the second opening, and is thus entirely out of the way. It is made so that the exhaust may be taken out at either side. The heater is not connected to the bed, and may be removed by simply taking out the bolts that fasten it to the Cylinder. The heat from it does not affect the bed or working parts of the Engine, nor can any harm be done the bed by the bursting of the Heater by frost.

All the parts are made to special steel templates and gauges, thus insuring exactness and perfect uniformity.

When ordering, state whether you want a right or left hand Engine (the cut is right hand), also, whether you want a Band Fly-Wheel or Fly-Wheel and Pulley; also, whether you want Pump, Heater, Governor or Throttle.

The price of Engine does not include any Steam, Exhaust or Water Pipes, Foundation Bolts or Governor Belt. All brass fittings are furnished with each Engine, also two wrenches.

Look carefully at our table of dimensions, as our Engines have 10 per cent. greater piston area to the Horse Power than is given by any other Engine in the market.

We claim to make the best Plain Slide Valve Engine in the market, and our prices are reasonable enough to suit any one.

When specially ordered, we make these Engines with Centre Crank. We also mount Nos. 4, 5, 6 and 7 on Boilers or those desiring a first-class powerful Portable Engine.

PHŒNIX STATIONARY ENGINES.

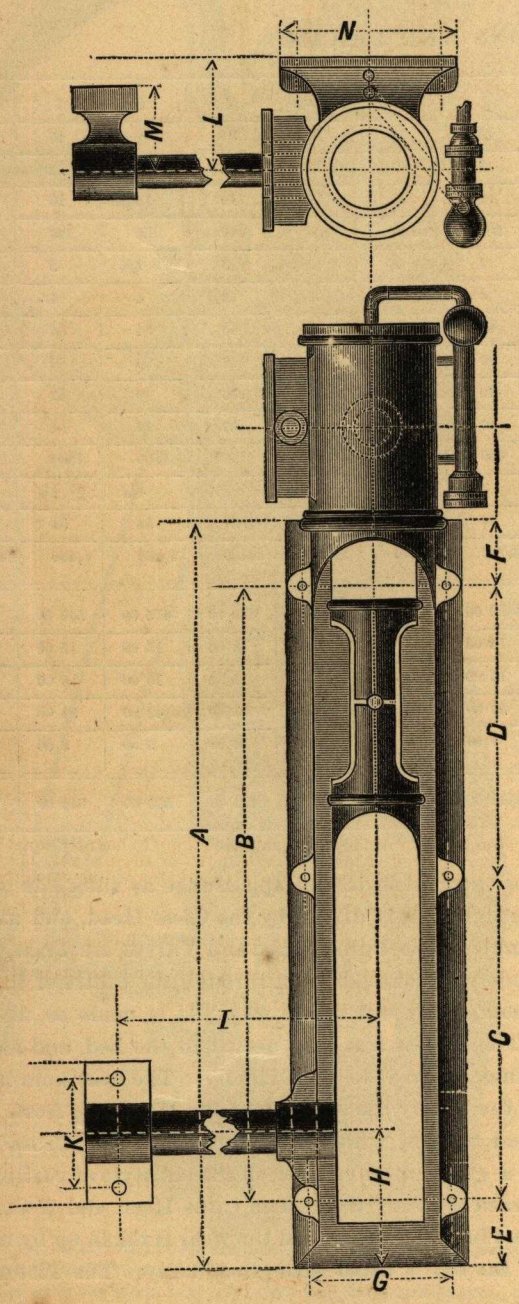
DIMENSIONS AND PRICES.

Number of Size	1	2	3	4	5	6	7
Horse Power	15	20	25	30	30	40	50
Diameter of Cylinder, in inches	8½	9½	10½	12	10	12	14
Length of Stroke, in inches	12	12	12	12	16	16	16
Number of Revolutions per minute	200	200	200	200	150	150	150
Diameter of Steam Pipe, in inches	2	2	2½	3	2½	3	3½
Diameter of Exhaust Pipe, in inches	3½	3½	3½	3½	4	4	4
Diameter of Band Fly-Wheel, in inches	48	48	60	60	84	84	84
Diameter of Fly-Wheel, in inches	60	60	72	72	96	96	96
Diameter of Pulley, in inches	30	32	34	36	40	42	48
Width of Belt, in inches	10	10	12	12	14	14	14
Weight of Balance, in pounds	600	600	750	750	1500	1500	1500
Diameter of Shaft, in inches	3⅜	3⅜	3⅜	3⅜	4¼	4¼	4¼
Length of Shaft, in inches	54	54	54	54	54	54	54
Shipping Weight of Engine, complete	2,700	2,800	3,000	3,100	4,200	4,400	4,600
Price of Engine and Balance Wheel	$300 00	320 00	350 00	400 00	475 00	550 00	650 00
Price of Pump	15 00	15 00	15 00	15 00	15 00	15 00	15 00
Price of Heater	15 00	15 00	15 00	15 00	15 00	15 00	15 00
Price of Governor	32 00	32 00	42 00	54 00	42 00	54 00	65 00
Price of Throttle	4 00	4 00	6 00	8 00	6 00	8 00	10 00
Price of Engine, complete	$366 00	386 00	428 00	492 00	553 00	642 00	755 00

All of the above Engines are of the same general style and appearance as shown in cut on opposite page. The Pump is fastened to the Cylinder, is driven by the Cross-Head, and may be disconnected or taken off entirely in one minute. The Pump-Seats and Valves are brass. The Heater is fastened to the bottom of the Cylinder, and extends back through the centre of the bed as far as the second opening, and is thus completely out of the way. It is made so that the Exhaust may be taken out at either side. The Heater is not connected to the bed, and may be taken out by simply unfastening the bolts that fasten it to the Cylinder. The heat from it does not affect the bed, nor can any harm be done the bed by the bursting of the Heater by frost. The Cross-Head is fitted with brass gibs, top and bottom, which are adjustable. The Cross-Head Wrist Pin is made of steel. This feature is a great improvement on the old style of casting the pin in Cross-Heads, as it is stronger and is turned perfectly true. The Cross-Head end of Connection Rod has a taper brass bushing; the Wrist Pin also is taper, and the wear is taken up by means of the nut shown in cut. The other end of the rod is fitted with gib and key. The Piston and Valve Rods are steel.

When ordering, state whether you want a Right or Left-Hand Engine. (The cut is right-hand.) Also, whether you want a Band Fly-Wheel or Fly-Wheel and Pulley; also, whether you want Pump, Heater or Governor. We do not furnish Stop-Valves with Governor unless especially ordered, and an extra charge is made for same. The price of Engine does not include any Steam or Exhaust Pipe, Foundation Bolts or Governor Belt. All brass fittings are furnished with the Engine.

PHŒNIX STATIONARY ENGINES, CLASS A.

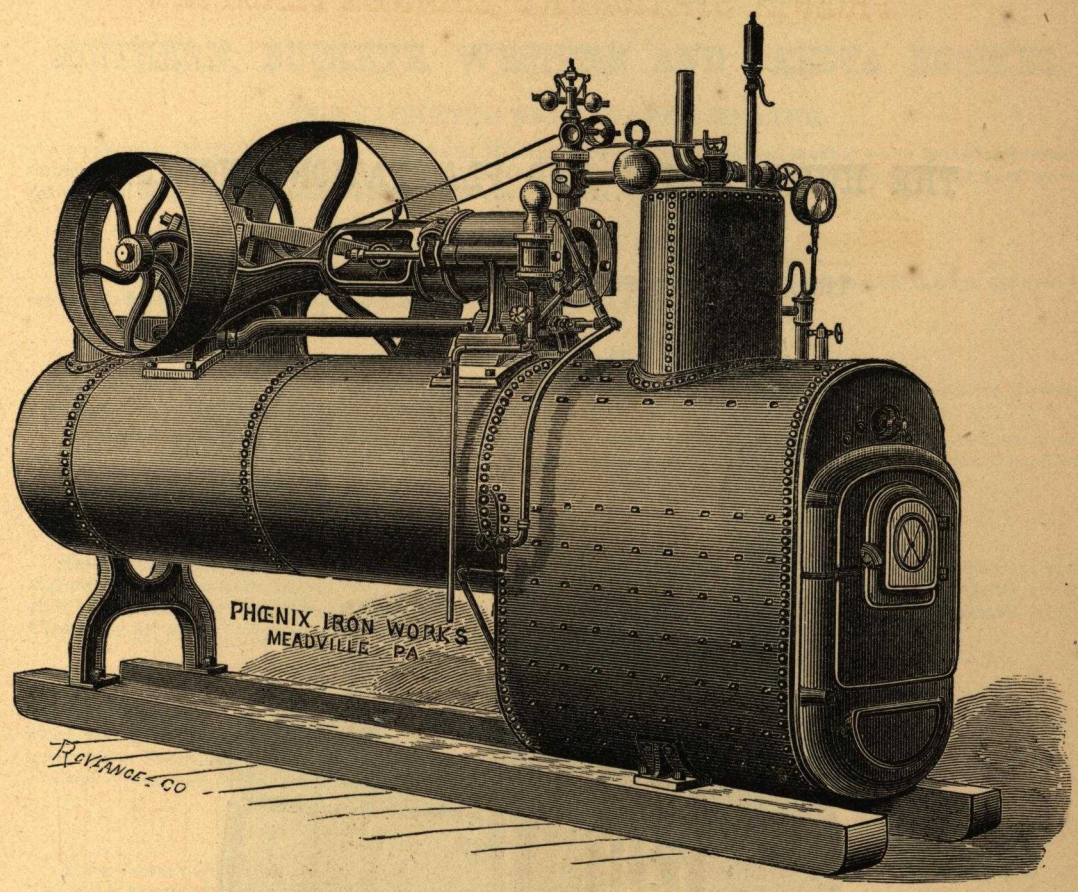


FOUNDATION PLAN.

SIZE OF ENGINE.		A	B	C	D	E	F	G	H	I	K	L	M	N
8¼ x 12	Length in Inches.....	77¾	61½	.....	.....	7¼	9	16¼	15	52	11	12	5¾	19
9½ x 12	Length in Inches.....	77¾	61½	.....	.....	7¼	9	16¼	15	52	11	12	5¾	19
10½ x 12	Length in Inches.....	77¾	61½	.....	.....	7¼	9	16¼	15	52	11	12¾	5¾	19
12 x 12	Length in Inches.....	77¾	61½	.....	.....	7¼	9	16¼	15	52	11	12¾	5¾	19
10 x 16	Length in Inches.....	95	79	42½	36½	8	8	19	17	58	14½	14	9	22
12 x 16	Length in Inches.....	95	79	42½	36½	8	8	19	17	58	14½	14	9	22
14 x 16	Length in Inches.....	95	79	42½	36½	8	8	19	17	58	14½	14	9	22

The above table gives all the measurements necessary for putting up a foundation. By referring to the cut it can be seen at a glance what the measurements refer to, and the different measurements are represented by letters corresponding to those in the table. The measurements are all given *in inches*. The Engines of 12 inch stroke have but two bolt holes on a side; those of 16-inch stroke have three. The bottoms of the beds of all these Engines are planed perfectly true. Be very particular to see that the Pedestal Box is set so that the shaft shall be perfectly in line.

IMPROVED "PHŒNIX" PORTABLE ENGINE, CLASS B.



We offer a Portable Engine of new design, neat, simple and durable, and guarantee them to be fully equal to any in the market. Do not be deceived by the high rated horse power of many engines now on the market, but examine carefully the dimensions of the Boiler, which is the real source of power. We give greater boiler capacity than is given by any other maker. We prefer to use large tubes, as the smaller the tube the greater the liability of choking and impairing the draft. The Boilers have safety fusible plugs in the crown sheets. The Engines have all necessary Oil Cups, Steam Gauge, Water Gauge, Whistle, Safety Valve and Gauge Cocks. Cold Water Pump is extra. We mount these Engines on Wheels when specially ordered. The Engine can be taken off the Boiler and placed on a foundation, the Boiler Saddle being made separate from the Engine. We also make a special Portable Engine by mounting four sizes of our Stationary Engines, Class A. These are made Centre Crank same as Class B, and are especially designed to meet the demand for a first-class powerful Portable Engine, and are superior in every way to any other Engine in the market. All Engines thoroughly tested with steam before shipment.

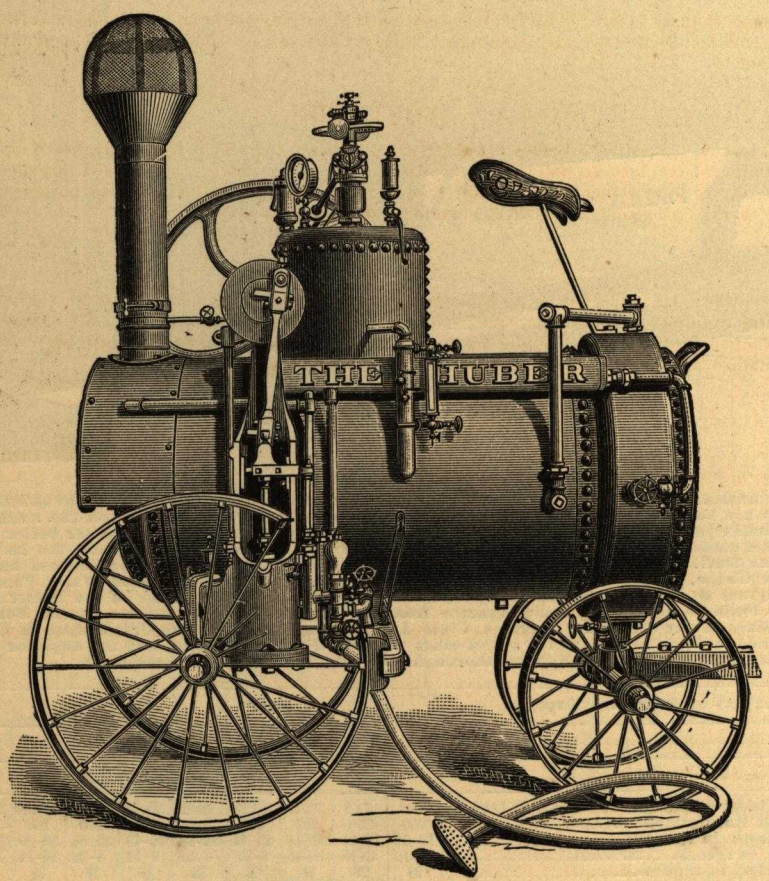
Specifications of Portable Engines.	Class B.							Class A.			
Number of Size	00	0	1	2	3	4	5	6	7	8	9
Horse Power	6	8	10	12	15	20	25	30	30	40	50
Diameter of Cylinder and length of Stroke, in inches.	5x8	6x8	7x10	8x10	8x12	9x12	10x12	10x16	12x12	12x16	14x16
Usual Number of Revolutions	250	250	225	225	200	200	200	150	200	150	150
Diameter of Pulleys, in inches	16-36	16-36	20-44	20-44	32-48	32-48	32-54	36-60	34-54	36-60	36-72
Face of Pulleys, in inches	8-10	8-10	8-10	8-10	8-12	8-12	8-12	10-14	10-12	10-14	10-14
Diameter of Boiler, in inches	28	28	30	32	32	35	38	38	40	40	46
Length of Furnace, in inches	36	36	38	38	44	48	52	60	52	60	60
Width of Furnace, in inches	22	22	24	26	26	29	32	32	34	34	38
Height of Furnace, in inches	34	34	36	38	38	40	40	45	45	45	45
Number of 3-inch Tubes	22	22	22	26	24	30	36	36	42	42	52
Length of Tubes, in inches	72	72	78	78	90	90	92	120	108	120	120
Diameter of Dome, in inches	14	14	16	16	18	20	22	24	24	24	26
Height of Dome, in inches	18	18	20	21	21	22	22	28	26	28	28
Diameter of Stack, in inches	14	14	14	16	16	16	18	18	20	20	22
Length of Stack, in feet	18	18	18	20	20	24	24	30	28	35	35
Estimate Weight, complete, pounds	4,000	4,500	5,500	6,000	7,000	7,500	8,000	11,500	10,500	12,000	13,000
Price of Engine and Boiler, complete, on skids	$625	$650	$725	$800	$875	$980	$1,100	$1,500	$1,400	$1,750	$2,000

The price of Engine and Boiler, when sold together, mounted on skids, includes Governor, Heater, Pump, Oil-Cups, Pet-Cocks, Smoke-Stack, Steam-Gauge, Water-Gauge, Whistle, Safety Valve, Gauge-Cocks, Check and Blow-off.

Prices subject to change without notice.

THE HUBER FARM AND PLANTATION ENGINE.

TRACTION, STANDARD AND STRAW BURNER.



This Engine is particularly adapted to the wants of Farmers and Planters as furnishing the lightest, cheapest, safest and every way the most durable, efficient and economical steam power on the market. As regards material, construction, design and furnishings, all can be said of it that can be said of all others; besides, it possesses points of superiority found on no other Engine sold.

SOUTHERN, BUCKEYE, WESTERN AND DAKOTA ENGINES.

THE JACKETED FEED WATER HEATER,

Which receives the feed water from the Exhaust Heater, raises the temperature of the feed water to the temperature of that in the boiler. At the same time, all the impurities that are in the feed water are precipitated and pure water fed to the boiler, saving incrustations in the boiler and fuel in the furnace.

SUPER-HEATING STEAM.

It is universally conceded that heat is power, and the arrangement of the steam pipe passing through the hottest part of the fire insures the keeping up of the heat of the steam in its passage to the engine.

RETURN FLUE BOILER,

Having no high and dangerous crown sheet; no flat surfaces to give way; no stay bolts to leak; no firing directly against the ends of the flues, to cause alternate expansion and contraction and leakage.

We make some changes in our list of Engines in order that we may better suit the trade in different sections of the country. Our smallest Engine we call "Southern," the next size larger "Buckeye," the next "Western," and our largest "Dakota."

SOUTHERN.

Nine-horse power, has boiler 33 inches diameter, 22x30 furnace, ten 3-inch flues 48 inches long, cylinder 6x8 with 32x7 pulley running 265 revolutions, and is particularly adapted to the South, and is used largely for driving cotton gins, small separators up to 30 inch cylinder, and it will give power up to full nine-horse power, and weighs, when filled ready for work, 3,800 pounds, furnished, mounted and on skids as desired.

BUCKEYE.

Ten-horse power. This size has boiler 33 inches diameter, 22x30 furnace, ten 3-inch flues 54 inches long, cylinder 6½x8, 32x7 pulley running 265 revolutions, and is calculated for market of Ohio, Indiana, Michigan, and wherever ten-horse power Engines are used. Will handle any but the Mammoth Separators of the Northwest. This is the standard size and is furnished, mounted, on skids, and as a Traction; weighs as standard 4,000.

WESTERN.

Eleven-horse power has boiler 36 inches diameter, twelve 3-inch flues 54 inches long, 24x30 furnace, cylinder 7x8, 32x7 pulley running 265 revolutions and is adapted to the needs of the West, and is furnished as Standard, Traction and Straw Burner, and is a favorite size, as it can be used to advantage on small pony saw mills; weighs as standard 4,200.

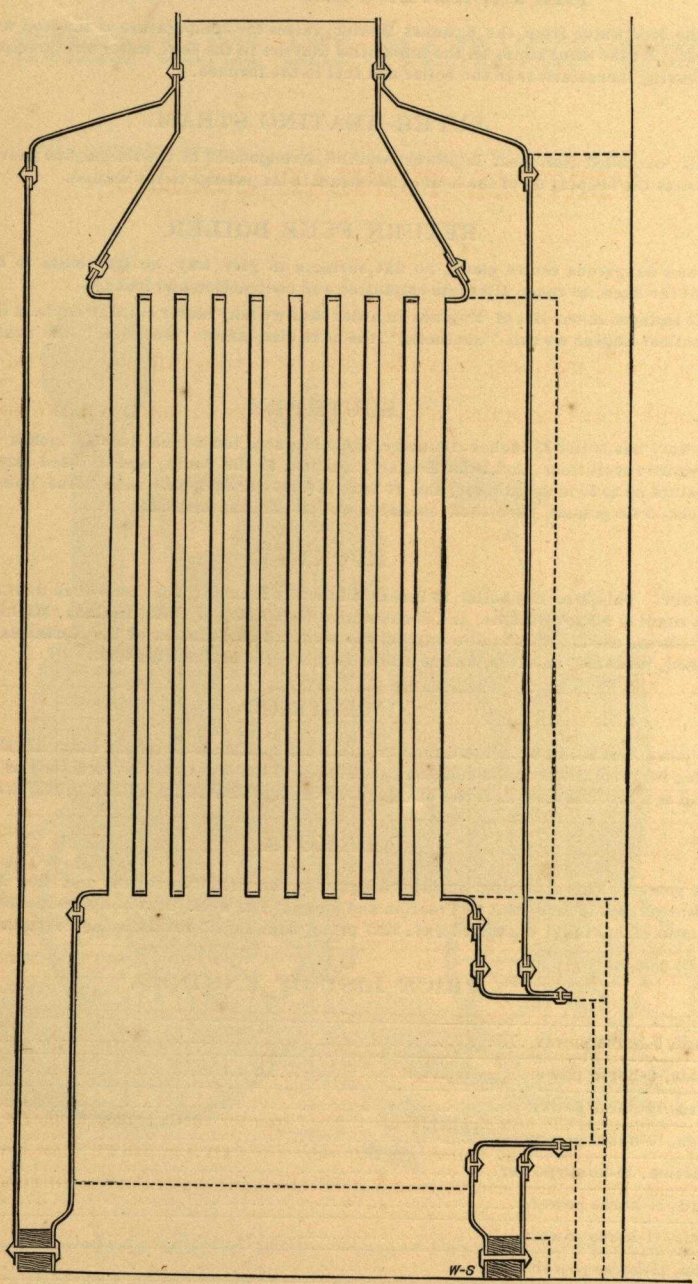
DAKOTA.

Twelve-horse power. This size is particularly adapted to the great Northwest and Red River Valley, and is our standard Straw Burner, but is furnished as Traction and Standard as well. Has boiler 36 inches diameter, 24x30 furnace, twelve 3-inch flues 60 inches long, cylinder 7½x8, 32x7 pulley running 265 revolutions; weighs as standard 4,400.

PRICE LIST OF ENGINES.

Southern Standard, 9-horse power	$ 850 00
Southern, on Skids, 9-horse power	775 00
Buckeye Standard, 10-horse power	900 00
Buckeye, on Skids, 10-horse power	825 00
Buckeye, on Traction, 10-horse power	1,050 00
Western Standard, 11-horse power	950 00
Western, on Skids, 11-horse power	875 00
Western Traction, 11-horse power	1,100 00
Western Straw Burner, 11-horse power	1,100 00
Dakota Standard, 12-horse power	1,000 00
Dakota, on Skids, 12-horse power	925 00
Dakota Traction, 12-horse power	1,150 00
Dakota Straw Burner, 12-horse power	1,150 00

VERTICAL TUBULAR BOILERS.



The above cut represents a section of our Vertical Tubular Boiler, made with steam chamber over the flues so that the top of the flues will be entirely covered with water, which will prevent starting with hard firing. See pages 443 and 444 for illustration and price list.

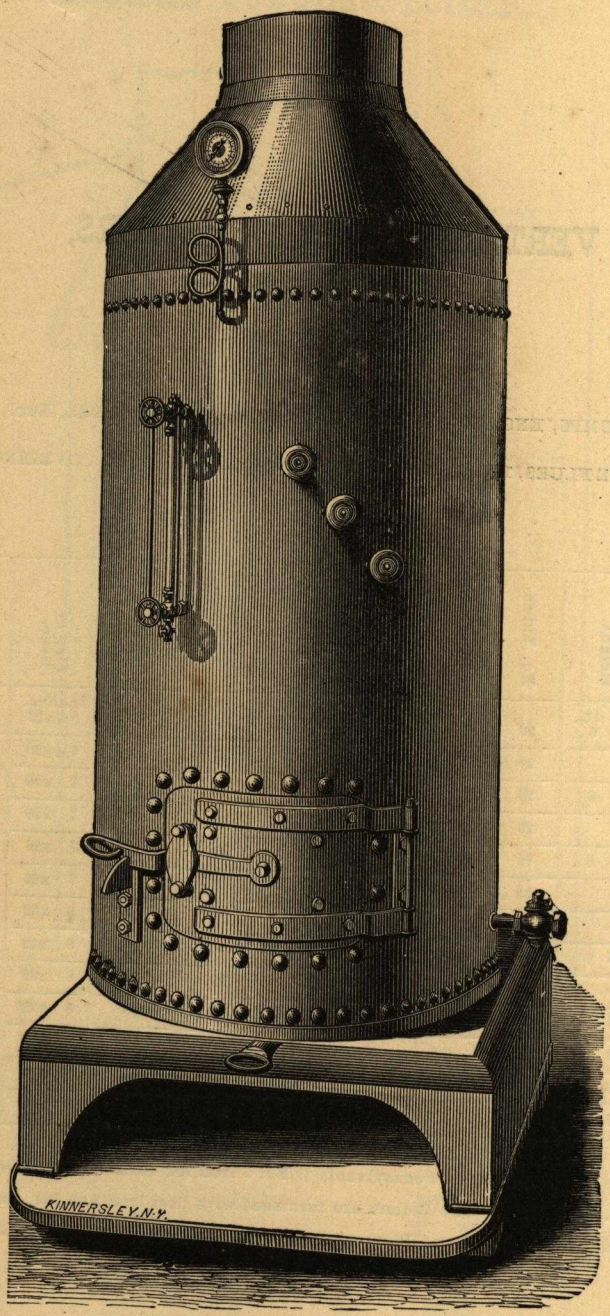
VERTICAL TUBULAR BOILERS,

FOR RUNNING STEAM PUMPS, ENGINES, STEAMING FEED, HEATING HOUSES, ETC., ETC.—WITH STEAM CHAMBER ABOVE THE FLUES, 18 INCHES IN HEIGHT; WATER IN BOILER COVERING TOPS OF FLUES.

No.	Horse Power.	Diameter of Boiler.	Height.	No. Tubes.	Size Tubes.	Length of Tubes.	Depth of Furnace.	Diameter of Furnace.	Diameter of Smoke Pipe.	Size of Base.	Weight of Boiler.	Weight of Castings.	Price.
		Inches.	Ft. In.							Inches.			
1	2	21	3 6	20	2	16	17	18	7	6½x23	555	166	$ 156 00
2	2½	21	4	20	2	18	17	18	7	6½x23	600	166	163 00
3	3½	21	4 6	20	2	20	20	18	8	7 x26	680	252	188 00
4	4½	26	5	29	2	24	21	22	8	7 x26	800	252	198 00
5	5½	26	5 6	29	2	30	21	22	8	7 x26	900	252	210 00
6	6½	26	6	29	2	36	21	22	8	7 x26	920	252	225 00
7	6½	30	5	42	2	24	21	25	10	8 x32	1,100	350	275 00
8	7	30	5 6	42	2	30	21	25	10	8 x32	1,200	350	300 00
9	7½	30	6	42	2	36	21	25	10	8 x32	1,300	350	325 00
10	8½	30	6 6	42	2	42	21	25	10	8 x32	1,350	350	335 00
11	9½	35	6	60	2	36	21	30	12	9 x38	1,500	550	375 00
12	10½	35	6 6	60	2	42	21	30	12	9 x38	1,650	550	400 00
13	12	35	7	60	2	48	21	30	12	9 x38	1,750	550	425 00

The above Boilers are made of the best Pennsylvania C No. 1 iron for shells. Best flange for the top head, and the furnace entirely of E. L. B. Iron. The Boilers are furnished with Cast Iron Ash Pit, Base Grate, Smoke Burner, Safety Valve, Gauge Cocks, Feed, Check and Blow-off Valves, Steam and Water Gauges, all fitted to the boiler.

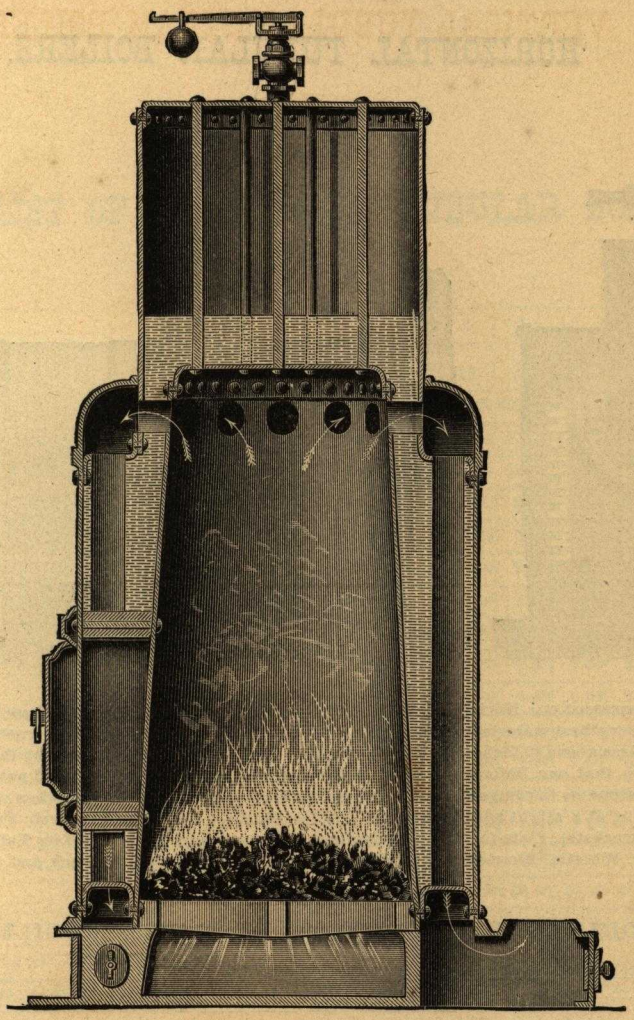
VERTICAL TUBULAR STEAM BOILERS.



These Boilers are made with especial reference to strength and durability. They are made with a steam space above the flues, which prevents burning or starting the flues while firing up before steam is raised.

For sizes and prices, see page 443.

SHAPLEY BOILER.



This Boiler is constructed so as to generate the greatest amount of steam with the smallest possible amount of fuel. The Tubes and Crown Sheets are as far removed as possible from the intense heat of the furnace. All the heating surfaces are below the water-line, hence no liability to burn out the Boiler, therefore are more durable. The combustion chamber being unusually large, perfect combustion ensues. Any kind of fuel can be used. The large Reservoir for Steam in this Boiler overcomes the difficulty in most Boilers of priming, or making wet steam. Easy access to the Tubes is obtained by means of a "Jacket," which surrounds the Boiler between the upper and lower sections. This "Jacket" is made in sections, and can be easily removed, Tubes cleaned with flue-brush, and Jacket replaced, and joints filled with wet clay, if necessary. It is well known that much heat is lost by the Tubes becoming foul, and this easy method of cleaning them obviates this difficulty.

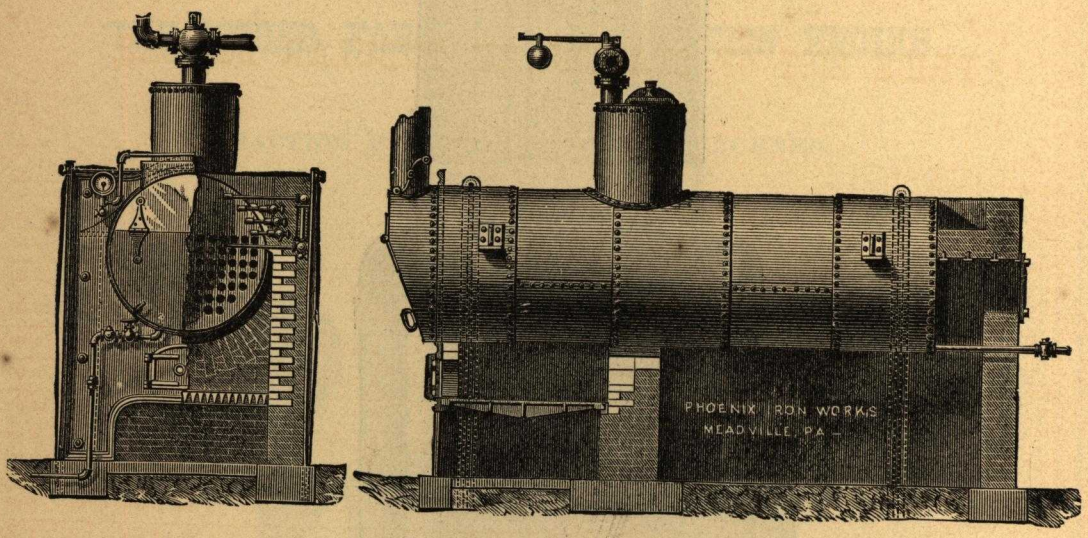
DIMENSIONS OF SHAPLEY BOILER.

Horse Power.	Lower Section.		Upper Section.		Conical Fire Box.			Vertical Tubes.			Cross Tubes.		Price of Boiler complete with Base, Grates, and all Fittings
	Diam.	Height	Diam.	Height	Diam. at Base	Diam. at Top.	Height	No.	Diam.	Length	No.	Diam.	
	in.	in.	in.	in.	in.	in.	in.		in.	in.		in.	
3	24	24	17	24	17	12	32	22	1¾	24	8	3	$200 00
5	28½	32	20	26	20	14	40	23	2	30	11	3	215 00
8	32	38	24	29	24	17½	48	26	2	36	13	3	325 00
12	44½	39	36	34	36	28	50	38	2	38	20	3	500 00
15	45	44	36	39½	36	28	54	37	2¼	42	14	4	585 00

The above prices include Boiler, with Base, Grates, Safety Valve, Steam and Water Gauges, Blow-off, Feed and Check Valves and Try-cocks. Prices given for Boilers, from 15 to 50-horse power, on application.

HORIZONTAL TUBULAR BOILERS.

ARCH FRONT.



The above cuts represent our Horizontal Tubular Boiler, with Open Arch Front. These Boilers are made with the greatest care, of the very best materials, thoroughly stayed and tested to 150 pounds hydrostatic pressure. The longitudinal seams in all sizes above 40 inches are double riveted. The Smoke Box is formed by the extension of the shell of the Boiler. We claim that our Boilers are equal to any and inferior to none. We build nothing but first-class work, and will not furnish estimates in competition with cheap, inferior work. We furnish, when ordered, the Flush Front in place of the above style, at a slight additional cost. Boiler Fixtures comprise the Arch Front, Grates, Grate Rest, Back Stand (or Side Brackets), Plate for Smoke Chamber, Ash Door and Frame, Safety Valve, Steam Gauge, Water Gauge, 3 Gauge Cocks, Whistle, Blow-off Valve, Check Valve, Stop Valve, Smoke Stack and Guy Rods.

DIMENSIONS OF STATIONARY TUBULAR BOILERS.

Number of Size	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Horse Power, rated 15 square feet heating surface	10	15	20	22	25	30	35	40	45	50	60	70	80	90	100
Diameter of Boiler, inches	30	36	36	40	42	44	44	48	48	54	60	60	62	64	66
Thickness of Iron in Shell of Boiler	¼	¼	¼	¼	No. 3	No. 3	No. 3	5-16	5-16	5-16	No. 0	No. 0	⅜	⅜	⅜
Thickness of Heads	⅜	⅜	⅜	⅜	⅜	⅜	⅜	⅜	⅜	7-16	7-16	7-16	½	½	½
Length of Flues, feet	8	8	10	10	10	10	12	12	14	12	12	14	14	14	14
Number of 3-inch Flues	20	30	32	36	40	46	46	56	54	70	84	84	100	114	128
Square Feet Heating Surface	154	225	300	330	375	446	525	615	675	760	915	1,060	1,220	1,380	1,520
Height of Dome, inches	22	22	22	24	24	24	24	28	28	30	30	34	36	40	40
Diameter of Dome, inches	20	20	20	22	22	24	24	28	28	34	36	36	36	40	40
Diameter of Smoke Stack, inches	14	16	16	20	20	22	22	24	24	26	28	28	30	32	34
Length of Smoke Stack, feet	28	28	35	35	35	35	40	40	50	50	40	50	50	50	50
Weight of Boiler and Smoke Box, without Fixtures, about	2,020	2,350	3,000	3,500	3,830	4,100	4,600	6,050	6,850	7,600	8,900	9,400	10,200	11,000	11,700
Weight of Boiler Fixtures, about	1,730	1,750	1,800	2,000	2,190	2,200	2,285	3,400	3,450	3,550	4,100	4,300	4,900	5,400	5,800
Weight of Boiler and Fixtures, about	3,750	4,100	4,800	5,500	6,020	6,300	6,885	9,450	10,300	11,150	13,000	13,700	15,100	16,400	17,500

PRICE LIST OF STATIONARY TUBULAR BOILERS.

Number of Size	1	2	3	4	5	6	7	8	9	10	11
Horse Power of Boiler Rated at 15 Square Feet Heating Surface per Horse Power	10	15	20	22	25	30	35	40	45	50	60
Price Boiler, with Smoke Box or Breeching	$210 00	230 00	300 00	325 00	375 00	380 00	425 00	520 00	600 00	630 00	745 00
Arch Front	20 00	22 00	30 00	30 00	30 00	40 00	40 00	55 00	60 00	62 00	65 00
Grate Bars	10 00	15 00	25 00	25 00	25 00	28 00	32 00	40 00	40 00	45 00	50 00
Grate Rest	2 00	2 00	3 00	3 00	3 00	3 00	3 00	4 00	4 00	4 00	4 00
Boiler Stand	2 00	2 00	3 00	3 00	3 00	3 00	3 00	4 00	4 00	5 00	6 00
Plate for Smoke Chamber, back end	4 00	4 00	8 00	8 00	8 00	9 00	9 00	9 00	10 00	10 00	14 00
Ash Door and Frame	5 00	5 00	6 00	6 00	6 00	7 00	7 00	7 00	8 00	8 00	8 00
Safety Valve	5 00	5 00	10 00	10 00	10 00	10 00	12 00	12 00	15 00	15 00	15 00
Steam Gauge	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00
Water Gauge	6 00	6 00	6 00	6 00	6 00	6 00	6 00	7 00	7 00	7 00	7 00
Gauge Cocks (3)	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00
Whistle	6 00	6 00	7 00	7 00	7 00	7 00	7 00	8 00	10 00	10 00	10 00
Blow-off Valve	3 00	3 00	3 00	3 00	3 00	3 00	4 00	4 00	4 00	4 00	4 00
Check Valve	1 00	1 00	1 00	1 00	1 00	1 00	1 00	2 00	2 00	2 00	2 00
Stop Valve	2 00	2 00	2 00	2 00	2 00	2 00	2 00	2 00	2 00	2 00	2 00
Smoke Stack	25 00	30 00	36 00	36 00	36 00	50 00	60 00	65 00	68 00	70 00	75 00
Guy Rods	5 00	5 00	5 00	5 00	5 00	6 00	6 00	6 00	7 00	7 00	7 00
Price of Boilers, including all the above-named Fixtures, on board cars	$313 00	345 00	452 00	477 00	527 00	562 00	624 00	752 00	848 00	888 00	1,021 00

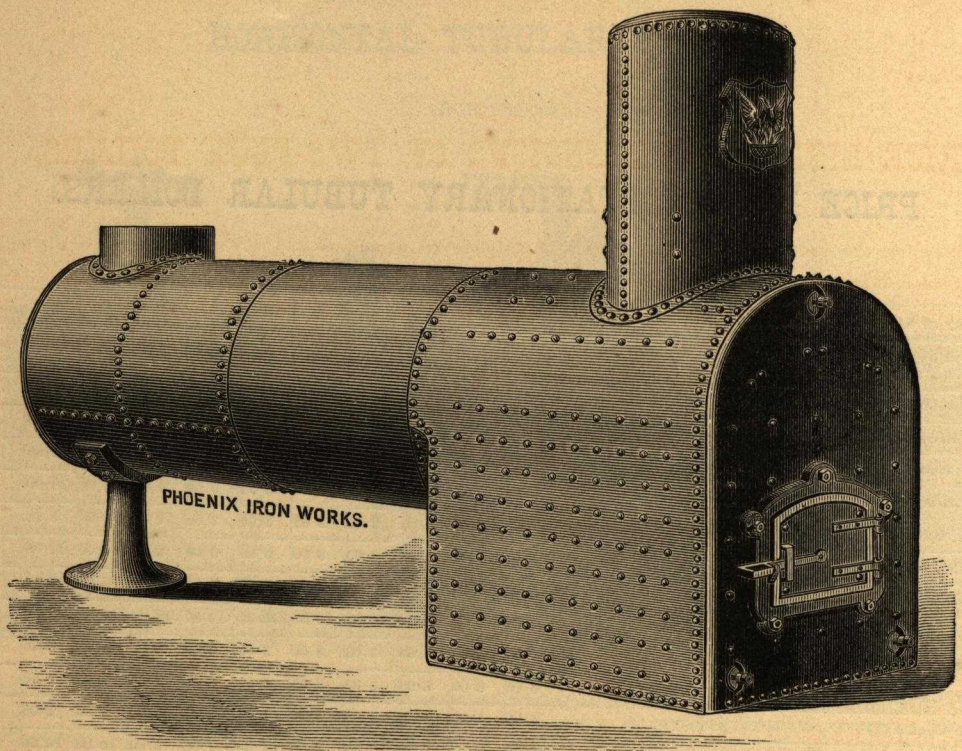
If the full list of Fixtures is not wanted, specify what you do want, and then price will be deducted as per list. If Boilers are ordered with all fixtures complete, we will send the full list. Anything ordered with Boiler not specified in the above list will be charged extra.

If Full Arch Fronts, Wall Brackets, Binding Bars and Bolts are wanted, add to above prices as per list below.

Number of Size	5	6	7	8	9	10	11
Full Arch Front (price to be added to above list when wanted)	80 00	80 00	80 00	85 00	85 00	90 00	90 00
Wall Brackets (4)	28 00	28 00	28 00	30 00	30 00	34 00	36 00
Binding Bars and Bolts	25 00	25 00	25 00	30 00	30 00	32 00	35 00
Total Cost Extras	$133 00	133 00	133 00	145 00	145 00	156 00	161 00

Above prices subject to change without notice.

PORTABLE BOILERS, CLASS C.



These Boilers are made of the best Charcoal Shell and Flange Iron, with best "Flange Fire Box" Iron in the Furnaces. The bottom and door rings are made of 2 x 3 inch Wrought Iron Bars, and the Boilers are thoroughly braced and stayed. We give three inch water space around the Fire Box, and put Safety Fusible Plugs in the Crown Sheets. All Boilers are tested thoroughly before shipment. Fixtures for above Boilers comprise Smoke Stack, Grates, Safety Valve, Gauge Cocks, Steam Gauge, Water Gauge, Stop, Blow-off and Check Valves.

SPECIFICATIONS OF PORTABLE BOILERS, CLASS C.

Number of Size	3	4	5	6	7	8	9	10	11
Estimated Horse Power	15	20	25	30	40	50	60	70	80
Length of Furnace inside, in inches	46	48	50	50	54	60	60	60	60
Width of Furnace inside, in inches	30	34	36	38	42	48	50	54	54
Height of Furnace above Grate	32	36	40	42	48	54	56	58	58
Number of 3-inch Tubes	28	34	40	44	56	60	66	76	76
Length of Tubes, in inches	90	96	96	108	108	132	144	144	168
Diameter of Stack, in inches	16	18	20	22	24	26	26	28	28
Length of Stack, in feet	20	24	24	24	30	36	40	40	50
Estimated Weight, with Fixtures complete	5,600	6,400	7,100	8,600	9,500	12,400	13,500	14,500	15,600

PRICE LIST OF PORTABLE BOILERS.

LOCOMOTIVE FIRE-BOX.

Number of Size	3	4	5	6	7	8	9
Horse Power	15	20	25	30	40	50	60
Price of Boiler	$540 00	635 00	700 00	850 00	1,029 00	1,292 00	1,384 00
Grates	21 00	25 00	27 00	30 00	35 00	40 00	45 00
Steam-Gauge	3 00	3 00	3 00	3 00	4 00	4 00	4 00
Gauge-Cocks (3)	4 00	4 00	4 00	4 00	6 00	6 00	6 00
Safety-Valve	6 00	6 00	8 00	8 00	10 00	12 00	15 00
Blow-off	3 00	3 00	4 00	4 00	6 00	6 00	6 00
Stop-Cock	2 00	2 00	3 00	3 00	5 00	5 00	5 00
Check-Valve	1 00	1 00	2 00	2 00	4 00	4 00	4 00
Stack	25 00	28 00	30 00	34 00	40 00	50 00	55 00
Guy-Rods	4 00	4 00	5 00	5 00	6 00	6 00	6 00
Price of Boiler and Fixtures, complete	$609 00	711 00	786 00	943 00	1,145 00	1,425 00	1,530 00

Subject to change without notice. The same rule applies to Fixtures for these Boilers as the Stationary Tubular Boilers.

PRICE LIST AND DIMENSIONS OF TWO-FLUE BOILERS.

These Boilers are made with great care from the best charcoal hammered iron, are double riveted in the longitudinal seams, thoroughly braced and carefully tested before leaving our Works. Boiler Fixtures comprise Arch Front, Grates, Grate Rest, Boiler Stand, Smoke Box Plate, Ash Pit Door, Safety Valve, Steam Gauge, Water Gauge, Gauge Cocks (3), Whistle, Blow-off Valve, Check Valve, Stop Valve, Smoke Stack and Guy Rods (four times the length of the Stack). Grates are 48 inches long and are in width equal to the diameter of the Boiler. All Smoke Stacks are made of No. 16 iron. If heavier is required, add for No. 14 twenty-five per cent., and for No. 12 seventy-five per cent. These Boilers may be made longer or shorter at the proportionate difference in price.

SPECIFICATIONS OF TWO-FLUE BOILERS.

Number of Size	1	2	3	4	5
Horse-Power	15	20	25	30	35
Diameter of Boiler, in inches	36	40	42	44	48
Length of Flues, in feet	15	18	20	24	25
Diameter of Flues, in inches	12	13	14	15	16
Thickness of Iron in Shell	¼	¼	9-32	9-32	5-16
Thickness of Iron in Flues	¼	¼	¼	9-32	5-16
Thickness of Iron in Heads	⅜	⅜	⅜	⅜	⅜
Height of Dome, in inches	22	22	24	24	28
Diameter of Dome, in inches	20	20	22	24	28
Length of Stack, in feet	40	40	50	50	50
Diameter of Stack, in inches	18	20	20	22	24
Weight of Boiler and Smoke Box, without Fixtures, about	3,800	4,700	5,750	7,100	9,200
Weight of Boiler Fixtures, about	1,900	2,600	2,700	2,800	3,500
Weight of Boiler and Fixtures, complete, about	5.700	7,300	8,450	9,900	12,700

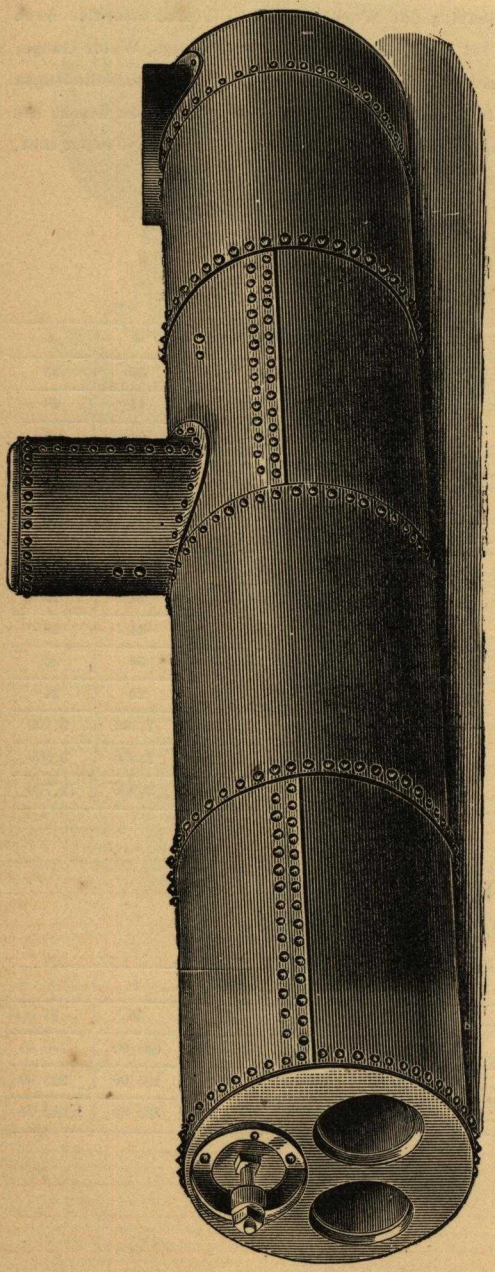
PRICES OF TWO-FLUE BOILERS.

Number of Size	1	2	3	4	5
Horse-Power	15	20	25	30	35
Price of Boiler	$390 00	475 00	555 00	640 00	790 00
Price of Fixtures	120 00	165 00	170 00	195 00	225 00
Price of Boiler and Fixtures, complete	510 00	640 00	725 00	835 00	1,015 00

Prices subject to change without notice. For illustration, see page 450.

TWO-FLUE BOILERS.

These Boilers are made with great care from the best charcoal hammered iron, are double riveted in the longitudinal seams, thoroughly braced and carefully tested before leaving our Works. Boiler Fixtures comprise Arch Front, Grates, Grate Rest, Boiler Stand, Smoke Box Plate, Ash Pit Door, Safety Valve, Steam Gauge, Water Gauge, Gauge Cocks (3), Whistle, Blow-off Valve, Check Valve, Stop Valve, Smoke Stack and Guy Rods (four times the length of the Stack). Grates are 48 inches long and are in width equal to the diameter of the Boiler. All Smoke Stacks are made of No. 16 iron. If heavier is required, add for No. 14 twenty-five per cent., and for No. 12 seventy-five per cent. These Boilers may be made longer or shorter at the proportionate difference in price.



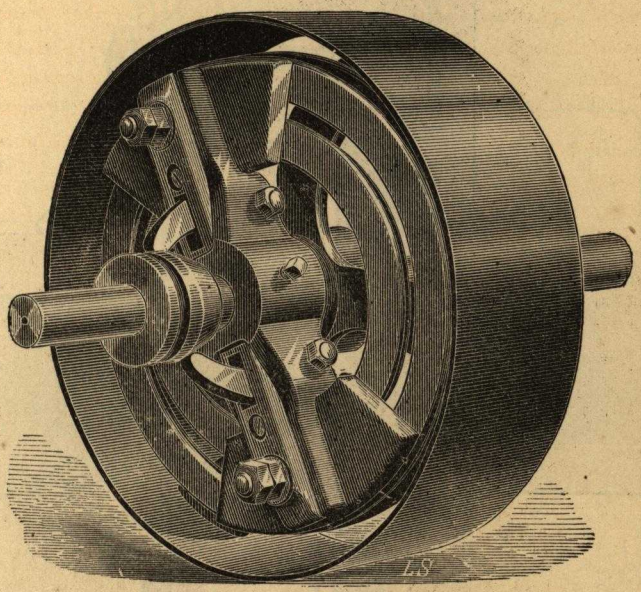
SPECIFICATIONS OF TWO-FLUE BOILERS.

Number of Size	1	2	3	4	5
Horse-Power	15	20	25	30	35
Diameter of Boiler, in inches	36	40	42	44	48
Length of Flues, in feet	15	18	20	24	25
Diameter of Flues, in inches	12	13	14	15	16
Thickness of Iron in Shell	¼	¼	9-32	9-32	5-16
Thickness of Iron in Flues	¼	¼	¼	9-32	5-16
Thickness of Iron in Heads	⅜	⅜	⅜	⅜	⅜
Height of Dome, in inches	22	22	24	24	28
Diameter of Dome, in inches	20	20	22	24	28
Length of Stack, in feet	40	40	50	50	50
Diameter of Stack, in inches	18	20	20	22	24
Weight of Boiler and Smoke Box, without Fixtures, about	3,800	4,700	5,750	7,100	9,200
Weight of Boiler Fixtures, about	1,900	2,600	2,700	2,800	3,500
Weight of Boiler and Fixtures, complete, about	5,700	7,300	8,450	9,900	12,700

For Price List, see page 449.

THE GIANT FRICTION CLUTCH PULLEY CAPTAIN.

No. 1.



The cut No. 1 is one of our Patent Friction Pulleys, for very heavy work. By a combination of levers in this mechanism, we are enabled to weigh the power to such a nicety as to relieve all strain and back lash, occasioned by a number of Engines or Engines and Water Wheels running together, when our clutch is employed to connect them.

In Rolling Mills, particularly Brass and Rubber Mills, it has no rival. Experience in its use has shown us that it is impossible for damage or breakage to occur to gearing or machinery on which it is used, if our directions are followed.

In Saw Mills, for hoisting logs, along Docks, in Mines, in Warehouses, and in fact for all heavy hoisting, it is finding universal favor. Its construction is very simple. The Pulley or Clutch runs loose on shaft, so that power can be transmitted at any desired speed and amount, allowing the engine or shaft to run at its full capacity at all times, if desired. The strong massive arms on one side, and bolts on the other side of the pulley ring, are brought in such positive contact with ring by a few pounds of pressure on Clutch lever, as to make the pulley as effective as if keyed to the shaft. This is the only Pulley in the market on which there is no Lubricator used on friction surfaces, and the only one on which dependence can be placed for heavy work.

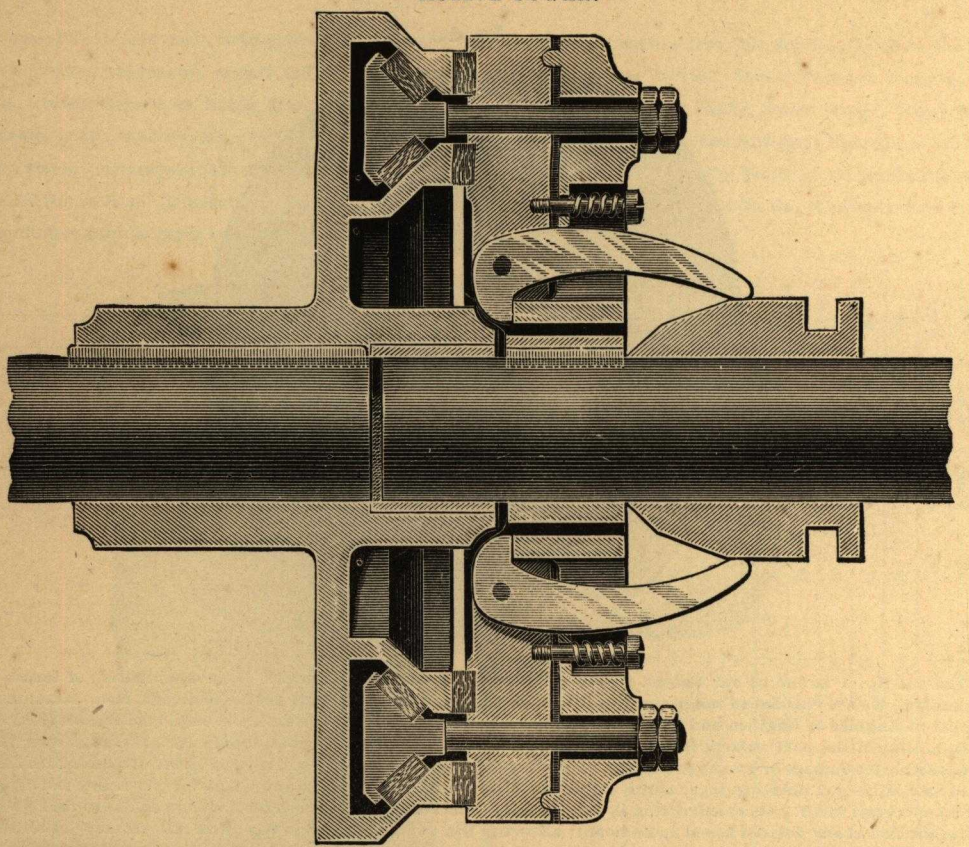
SIZES, CAPACITY AND PRICES.

Diameter.	Face.	Bore.	Price.	Diameter.	Face.	Bore.	Price.	Diameter.	Face.	Bore.	Price.
10 inch.	3	1 5-16	$12 00	22 inch.	9	2 3-16	$ 52 00	36 inch.	8	2 15-16	$103 00
12 inch.	3		15 00	24 inch.	7		52 00	36 inch.	10		110 00
12 inch.	4	1 7-16	17 00	24 inch.	9		55 00	36 inch.	14		128 00
13 inch.	4		18 00	24 inch.	10	2 15-16	72 00	42 inch.	10		130 00
14 inch.	4		23 00	24 inch.	12		76 00	42 inch.	14		142 00
14 inch.	5		24 00	26 inch.	6	2 7-16	72 00	48 inch.	10	3 15-16	143 00
14 inch.	6	1 11-16	28 00	26 inch	8		79 00	48 inch.	12		180 00
16 inch.	4		24 00	26 inch.	10	2 15-16	84 00	48 inch.	14		200 00
16 inch	5		28 00	28 inch	8		84 00	48 inch.	16		230 00
18 inch.	6		36 00	28 inch.	10		90 00	60 inch.	12		250 00
18 inch.	7		38 00	30 inch.	8		88 00	60 inch	16		275 00
18 inch.	9	1 15-16	43 00	30 inch.	10		94 00	72 inch.	14		300 00
20 inch.	6		42 00	30 inch.	12		98 00	72 inch.	16		330 00
20 inch.	8	2 3-16	48 00	34 inch.	8		98 00				
22 inch.	6		50 00	34 inch.	10		103 00				

Clutches all machinery moved by wheels in a perfect manner, with ease; is durable; runs without noise; no end thrust on Journals; no loss of power.

CLUTCH COUPLINGS,

FOR STOPPING OFF LINES OF SHAFTING WITHOUT STOPPING OR SLACKING THE SPEED OF MOTIVE POWER.



Also for starting heavy machinery of any kind, that needs to be brought up to the proper speed gradual, such as Force Pumps, Picker Rooms in Mills, Print Works, Bleacheries, Paper Mills, Circular Saw Mills, this Clutch has not its equal. All Pulleys or Clutches that run at usual high speed, should be bushed with bronze metal, for which we charge at cost. Shipping levers are of so great a variety that we make no provision for furnishing without a sketch of the positions of shaft and floor, when we will make estimates for what may be required.

Our list is of ordinary line and Counter-shaft Pulleys, but we should be pleased to furnish estimates for the Friction Clutch upon receipt of a full description of machinery to which it is to be applied. Parties building Hoisting Engines, and wishing to use this Clutch, can be furnished with Drum, Clutch Attachment and Shaft, at very low rates.

We also furnish Drums and Gearing of different sizes, and make a specialty of Counter-shafts; also, will furnish to order, Shafting, Hangers, Pulleys and Gearing. All orders entrusted to us will receive prompt attention.

SIZES, CAPACITY AND PRICES.

Shaft 1½ to 1¾ inches, 14 inches diameter of Clutch	$ 35 00
Shaft 1¾ to 2¼ inches, 17 inches diameter of Clutch	55 00
Shaft 2¼ to 3¼ inches, 21 inches diameter of Clutch	80 00
Shaft 2¾ to 3¼ inches, 24 inches diameter of Clutch	110 00
Shaft 3 to 4 inches, 25 inches diameter of Clutch	120 00
Shaft 3½ to 4 inches, 30 inches diameter of Clutch	175 00
Shaft 3¾ to 4 inches, 35 inches diameter of Clutch	225 00
Shaft 4 to 4½ inches, 40 inches diameter of Clutch	260 00
Shaft 4½ to 5 inches, 46 inches diameter of Clutch	325 00
Shaft 5 to 6 inches, 54 inches diameter of Clutch	450 00
Shaft 6 to 7 inches, 60 inches diameter of Clutch	700 00
Shaft 9 to 10 inches, 76 inches diameter of Clutch	1,200 00

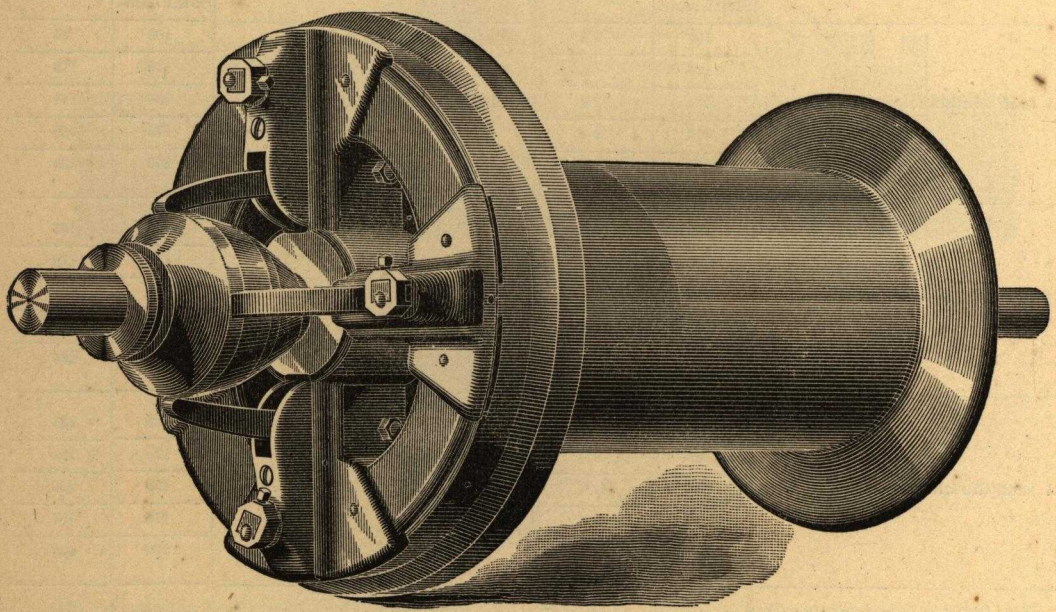
CAUTION.—In ordering Pulleys or Clutches, give the number of revolutions per minute, size Shaft, and horse-power as near as may be; whether to start quick or gradual.

POWER OF CLUTCHES.

Size of Clutch.	Number of Revolutions per minute Clutch Shaft runs.	Horse Power Clutch will Transmit.
14 Inch Clutch	100	1¼
	125	1½
	150	1¾
	175	2
	200	2¼
17 Inch Clutch	100	3½
	125	4½
	150	5½
	175	6½
	200	7½
21 Inch Clutch	100	7½
	125	9½
	150	11½
	175	13½
	200	15½
24 Inch Clutch	100	15
	125	18
	150	21
25 Inch Clutch	175	24
	200	27
30 Inch Clutch	100	33
	125	41
	150	49
	175	57
	200	65
35 Inch Clutch	100	50
	125	63
	150	76
	175	89
	200	102

Size of Clutch.	Number of Revolutions per minute Clutch Shaft runs.	Horse Power Clutch will Transmit.
40 Inch Clutch	100	97
	125	119
	150	141
	175	165
	200	189
46 Inch Clutch	100	142
	125	178
	150	214
	175	250
	200	286
54 Inch Clutch	100	233
	125	291
	150	349
	175	407
	200	466
60 Inch Clutch	75	281
	100	378
	125	476
	150	568
	175	662
	200	957
76 Inch Clutch	15	250
	35	581
	55	913
	75	1246
	95	1578

FRICTION HOISTING DRUM.



Hoisting Drums, with Friction Clutch fitted to short shafts of suitable sizes, so they can be coupled in lines or fitted with gears or pulleys and used singly. This Friction is especially adapted for use in Mines, on Docks, in Slaughter-houses, Quarries, etc., where power can be obtained for driving. One engine and engineer will run any number.

SIZES, CAPACITY AND PRICES.

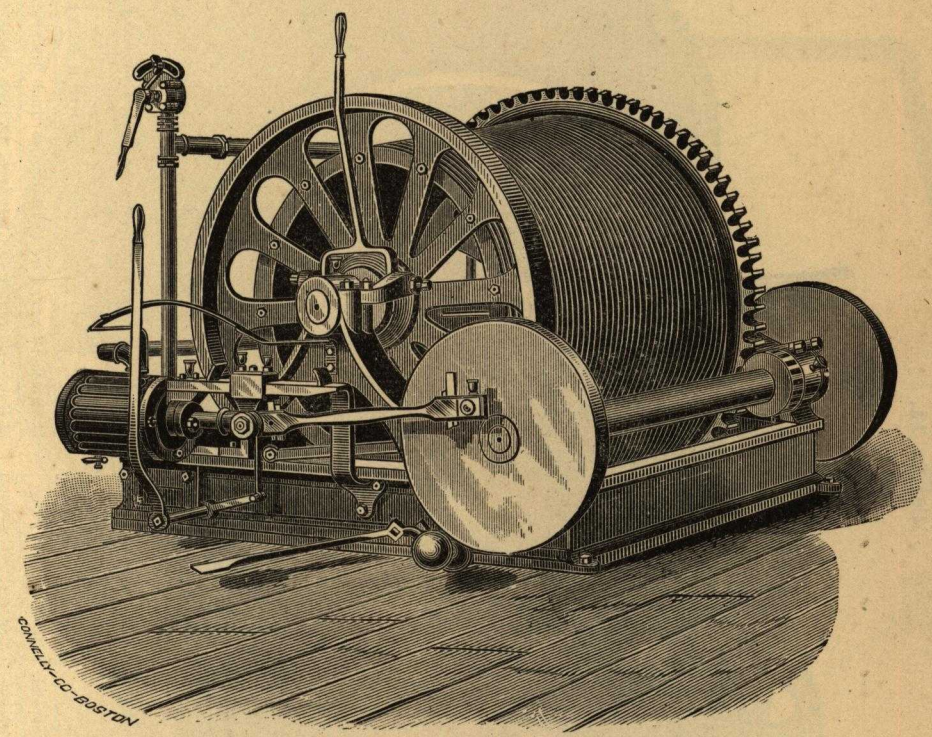
Drums 12 inches diameter, 20 inches long, 25 inches Friction Hoists, 1,200 pounds	$130 00
Drums 15 inches diameter, 20 inches long, 30 inches Friction Hoists, 2,500 pounds	165 00
Drums 15 inches diameter, 20 inches long, 35 inches Friction Hoists, 4,000 pounds	225 00
Drums 20 inches diameter, 24 inches long, 40 inches Friction Hoists, 6,000 pounds	265 00

Larger sizes furnished on application, stating the weight to be raised and height, whether wire rope or soft rope.

IMPROVED HOISTING ENGINES,

FROM 4 TO 50 HORSE-POWER, SINGLE AND DOUBLE.

Cut No. 10.



Our Engines are in daily use in most of the large cities in this and foreign countries. In size and style we can suit any requirement.

SIZES, CAPACITY AND PRICES.

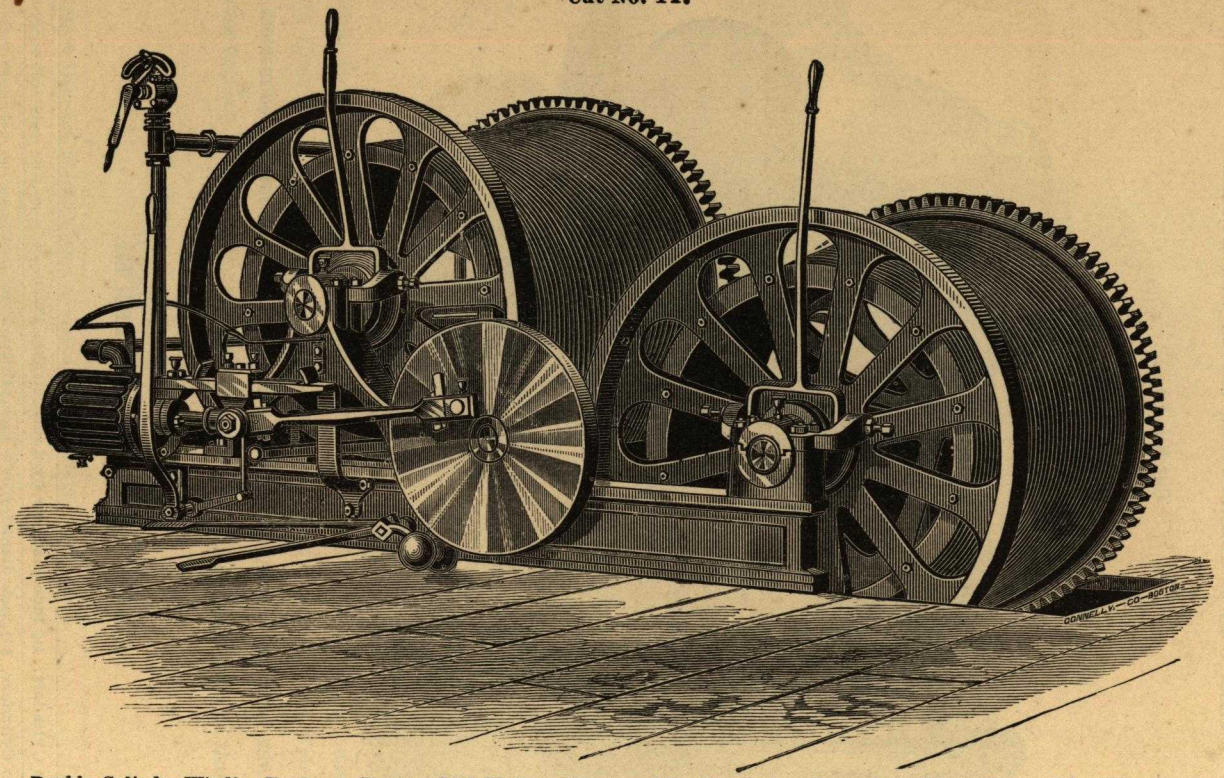
8 Horse-Power, Two Cylinders, 4½ inch diameter by 8 inch stroke, Price	$0 00
12 Horse-Power, Two Cylinders, 5¼ inch diameter by 8 inch stroke, Price	0 00
14 Horse-Power, Two Cylinders, 6 inch diameter by 8 inch stroke, Price	0 00
16 Horse-Power, Two Cylinders, 6½ inch diameter by 8 inch stroke, Price	0 00
20 Horse-Power, Two Cylinders, 7 inch diameter by 8 inch stroke, Price	0 00

Double-Cylinder Winding Engines. Reverse Link Motion. Cone-shaped Reel, Grooved for Wire Rope. Single Reel.

IMPROVED HOISTING ENGINES,

FROM 4 TO 50 HORSE-POWER, SINGLE AND DOUBLE.

Cut No. 11.



Double-Cylinder Winding Engines. Reverse Link Motion. Single and Double Reels. Cone-shaped Reel, Grooved for Wire Rope.

SIZES, CAPACITY AND PRICES.

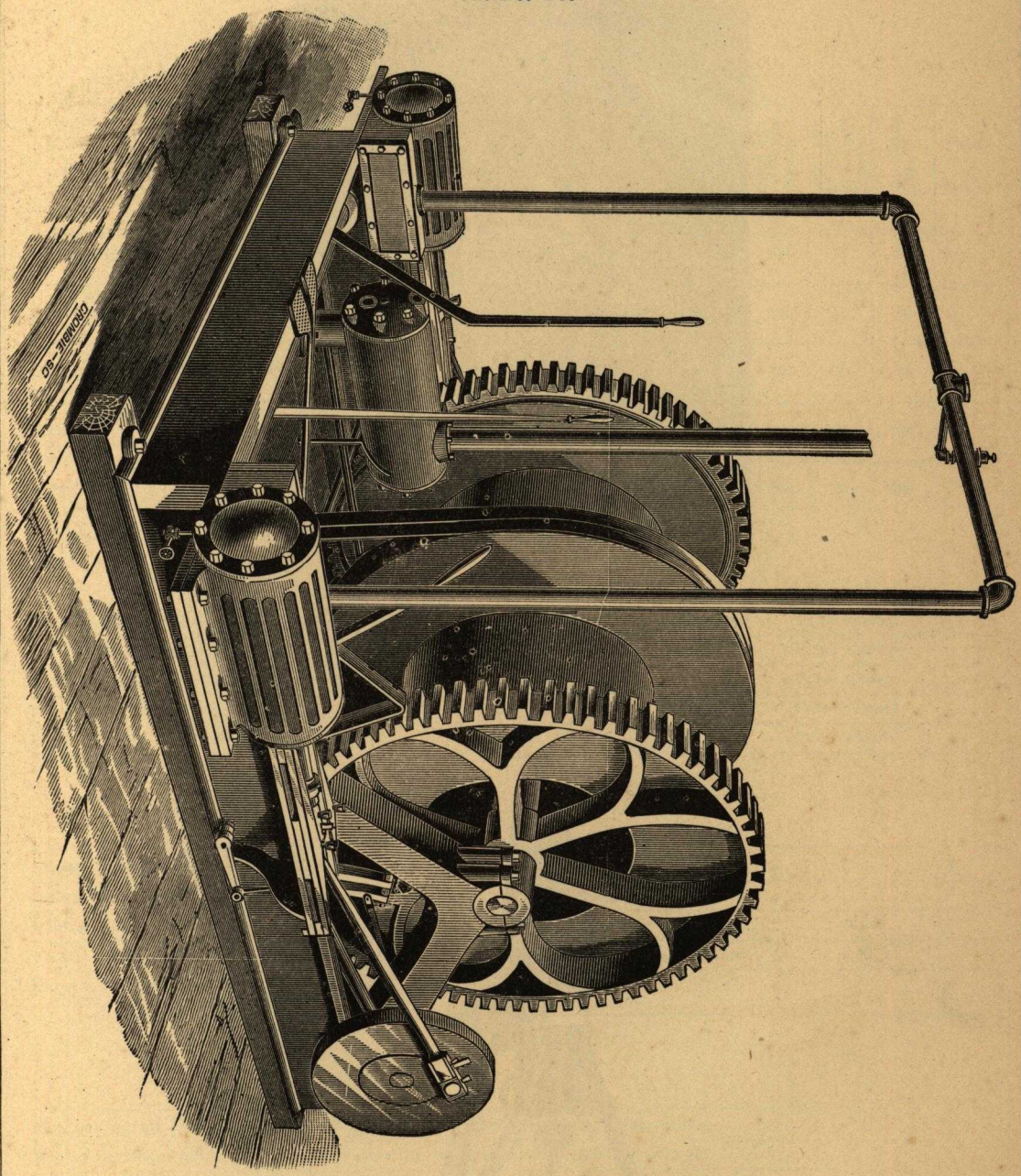
SINGLE REEL.	
14 Horse-Power, Two Cylinders, 6 inch diameter by 8 inch stroke, Price..	
16 Horse-Power, Two Cylinders, 6½ inch diameter by 8 inch stroke, Price..	
20 Horse-Power, Two Cylinders, 7 inch diameter by 8 inch stroke, Price..	

DOUBLE REEL.	
14 Horse-Power, Two Cylinders, 6 inch diameter by 8 inch stroke, Price....	
16 Horse-Power, Two Cylinders, 6½ inch diameter by 8 inch stroke, Price....	
20 Horse-Power, Two Cylinders, 7 inch diameter by 8 inch stroke, Price....	

IMPROVED HOISTING ENGINES.

OUR ENGINES ARE IN DAILY USE IN MOST OF THE LARGE CITIES IN THIS AND FOREIGN COUNTRIES.
IN SIZE AND STYLE WE CAN SUIT ANY REQUIREMENT.

Cut No. 16.



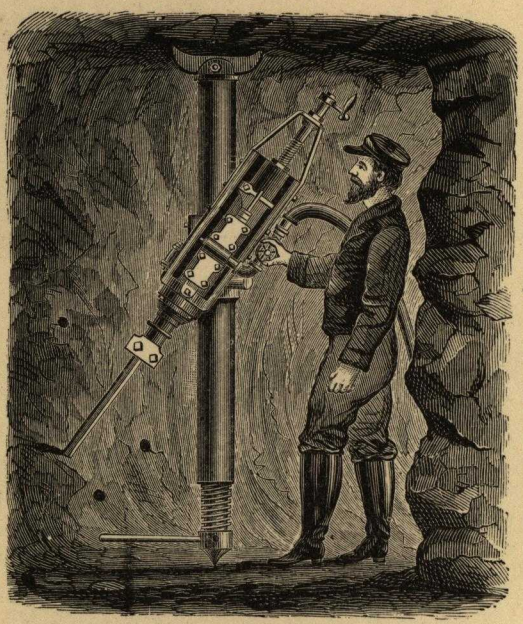
Double Cylinder, Double Drum Mining Engine. Reverse Link Motion.

SIZES, CAPACITY AND PRICES.

30 Horse-Power, Two Cylinders, 8 inch diameter by 15 inch stroke, Price	
40 Horse-Power, Two Cylinders, 9 inch diameter by 15 inch stroke, Price	
50 Horse-Power, Two Cylinders, 10 inch diameter by 15 inch stroke, Price	

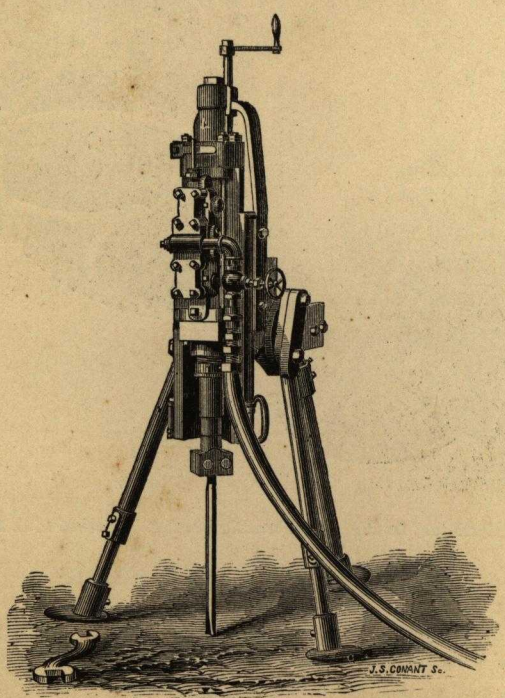
STOPING DRILL MOUNTED ON STOPING COLUMN.

Fig. E.



STOPING DRILL ON TRIPOD.

Fig. C.



STOPING DRILL.

Size Drill.	Diameter Cylinder, Inches.	Piston Stroke, Inches.	Length Feed, Inches.	Horse Power Required to run each.	Size Hole, Inches.	Depth Hole, Feet.	Depth in Ten Hours in Granite.	Weight Drill, Pounds.	Weight Six Foot Column, Pounds.	Weight per Foot Additional Length, Pounds.	Weight Clamp, Pounds.	Price Drill.
No. 1. Stoper....	3¼	6	24	3	1 to 1¾	12	60 to 120 feet.	237	214	15	50	$
No. 2. Intermediate.....	3⅛	6¾	28	3½	1¼ to 2	14		320	225	15	60	
No. 3 Mining.....	3⅞	7	25	4	1¼ to 2½	16		340	330	40	95	
No. 4. Tunnel.....	4⅜	7	40	5	1¼ to 2½	20		650	330	40	95	
No. 5. Sewer.....	4½	9½	44	7	1½ to 3	30		800	350	50	105	

Stoper Tripod, New Pattern, Universal Weighted Legs, weight 400 pounds.....	$	Price Clamp...	$
Intermediate Tripod, New Pattern, Universal Weighted Legs, weight 500 pounds..		Price Clamp..	
Mining Tripod, New Pattern, Universal Weighted Legs, weight 450 pounds.....		Price Clamp...	
Tunnel Tripod, weight 550 pounds		Price Clamp...	
Sewer Tripod, weight 600 pounds.....		Price Clamp...	

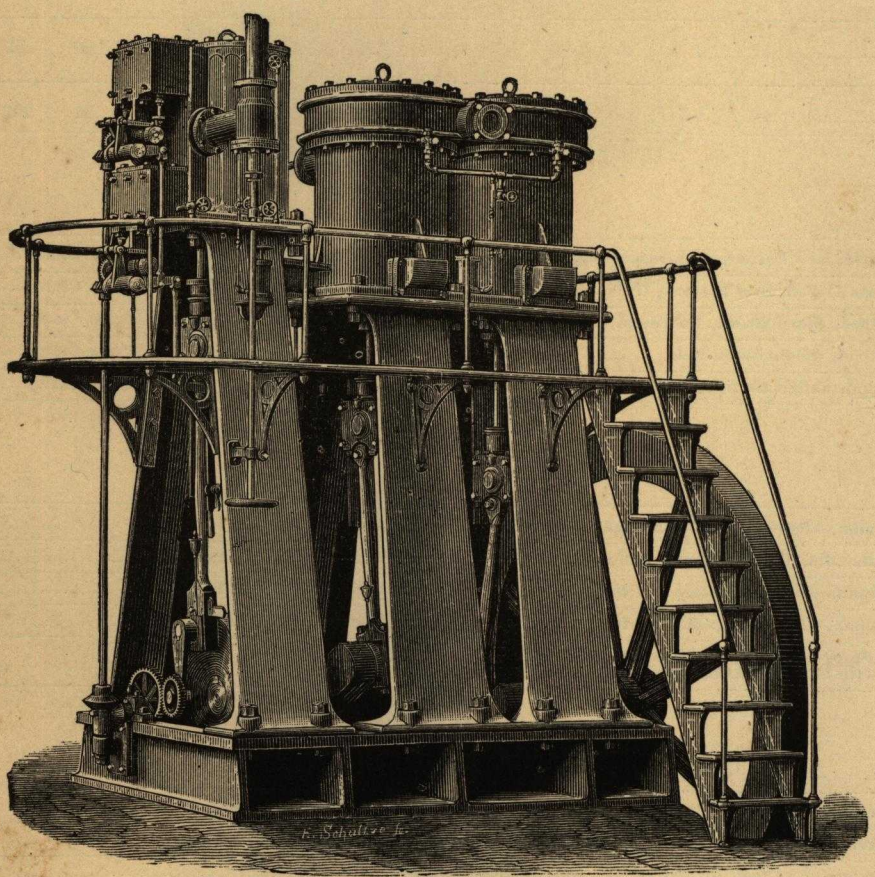
Stoper Column, 6 feet long, plain and light.....	$	Additional length, per foot.....	$
Intermediate Column, 6 feet long, plain and light.		Additional length, per foot.....	
Mining Column, 6 feet long, plain and light		Additional length, per foot.....	
Tunnel Column, 6 feet long, plain and light.....		Additional length, per foot.....	
Improved Stoper Column, 6 feet long, plain and light, with Swinging Arm, weight 275 pounds..			

Mining Carriage (Stoper), 4⅜ inch Column, with Swinging Arm, weight 750 pounds.....	$
Mining Carriage (Mining), 6 inch Column, with Swinging Arm, weight 900 pounds.....	
Tunnel Carriage, 7 x 7 feet, for two Drills, weight 4,500 pounds.....	
Tnnnel Carriage, 7 x 8 feet, for two Drills, weight 5,000 pounds.....	
Tunnel Carriage, 8 x 9 feet, for two Drills, weight 5,700 pounds.....	

NO. 7 IMPROVED BURLEIGH PATENT AIR COMPRESSOR.

REPRESENTING ADJUSTABLE CUT-OFF POPPET VALVE ARRANGEMENT FOR ENGINES.

SMALLER SIZES WITHOUT GALLERY OR STAIRS.



IMPROVED BURLEIGH PATENT AIR COMPRESSOR.

Size Compressor.	Air Cylinders, Inches.	Steam Cylinders, Inches.	Revolutions per Minute.	Free Air per Minute Cubic Feet.	Small Drills, each will run.	Large Drills, each will run.	Horse Power Required.	Weight Compressor, lbs.	Weight Tank, lbs.	Size Tank. In. Ft.	Diameter Steam Supply Pipe.	Diameter Steam Exhaust Pipe.	Diameter Air Discharge Pipe.	Price Compressor.
No. 1	10½ x 10	7 x 15	110	110	2	1	12	5,600	950	30 x 6	1¼ in.	2 in.	2 in.	
No. 2	12 x 15	9 x 18	100	195	3	2	24	8,600	1,150	36 x 6	2 in.	3 in.	3 in.	
No. 3	14¾ x 15	12 x 18	100	292	4	3	35	13,500	1,375	36 x 8	3 in.	3½ in	3½ in.	
No. 4	16½ x 15	15 x 18	95	352	6	4	45	15,000	1,950	42 x 8	3½ in.	4 in	4 in.	
No. 6*	20 x 20	18 x 24	85	615	7	6	60	40,000	2,200	42 x 10	4 in.	5 in.	5 in.	
No. 7*	24 x 20	18 x 24	80	830	8	7	75	45,000	3,800	48 x 12	4 in.	5 in	5 in.	
No. 10*	26 x 22	22 x 24	75	1,000	15	12	90	55,000	4,500	54 x 12	5 in.	6 in.	6 in.	
No. 1*	10½ x 12	9 x 15	110	120	2	1	10	7,600	950	30 x 6	1¼ in.	2 in.	2 in.	
No. 2*	12 x 15	10 x 18	100	195	3	2	18	10,000	1,150	36 x 6	2 in.	3 in.	3 in	
No. 4*	16¼ x 16	15 x 18	95	375	6	4	35	17,000	1,950	42 x 8	3½ in.	4 in.	4 in.	

* With adjustable cut-off poppet valve engine, and forged iron crank shafts.

Nos. 1 and 2 Compressors, cut into sections 300 pounds each, for transportation into inaccessible regions. Special prices on application.

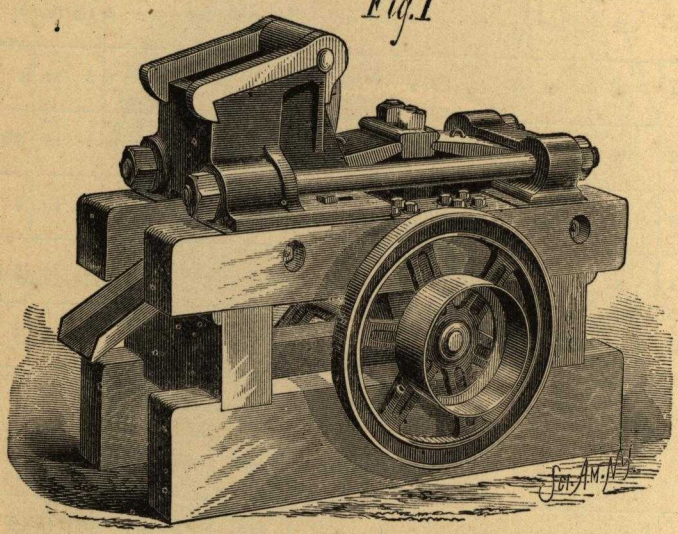
Air Hose, ¾ inch, 5-ply, with couplings complete (special make), per foot	
Air Hose, 1 inch, 5-ply, with couplings complete (special make), per foot	
Steam Hose, ¾ inch, 6-ply, wound with marlin, and couplings complete (special make), per foot	
Steam Hose, 1 inch, 6-ply, wound with marlin, and couplings complete (special make), per foot	
Steam Hose, 1¼ inch, 6-ply, wound with marlin, and couplings complete (special make), per foot	
Drill Points, finished and fitted, best English steel, per pound	

Special prices, on application, for Hoisting Engines and general Mining Machinery.

BLAKE'S CHALLENGE ROCK BREAKERS, OR, SECTIONAL CUSHIONED CRUSHERS.

(Patented Nov. 18th, 1879, No. 221,768, and Jan. 20th, 1880, No. 223,697.)

Fig. 1



Blake's Sectional Cushioned Rock Breaker will be found to be superior to any heretofore offered to the public.

In this Crusher all tensile strains are upon wrought iron or steel, instead of cast iron.

It is sectional—weight of heaviest piece in one of largest size Crusher being but 2,400 pounds

It has double the strength of our old forms of Crusher.

The stroke of the jaw can be maintained at any desired length, whatever the wear on toggles, etc., may have been.

Its construction admits largely increased length of toggles—without adding materially to the weight of the machine—and consequently of reduced strains on pitman and shaft.

It is so cushioned as to permit partial revolution of the fly wheels before coming to a full stop in case of undue strain, thus doing away with the rigidity inseparable from machines with cast iron frames, and greatly diminishing the chances of breakage.

We are now prepared to fill orders for the following sizes:

15 x 9
15 x 5
15 x 2
10 x 7
10 x 4

} Dimensions indicate the receiving capacity of machine in inches.

Read the following extract from testimonial of Road Commissioners City of New Haven, in regard to sectional Stone Breaker, after sixty days' trial, dated August 13th, 1879:

"We are satisfied that this Machine will prove far more economical than either of the old forms of Blake Crusher with which we are familiar, and that the saving in repairs on account of breakage, to say nothing of the delays incident thereto, will amount to the interest on many thousands of dollars."

CAUTION.—Parties are cautioned against purchasing machines of our old forms, which, after slight changes, are advertised as "the latest and most approved Blake Stone and Ore Crushers."

This Rock Breaker was awarded the "Medal of Superiority," by the judges of the American Institute Fair, New York City, December, 1879, where it was exhibited in competition with our old form of Crusher.

BLAKE'S CHALLENGE ROCK BREAKERS, OR, SECTIONAL CUSHIONED CRUSHERS.

(Patented November 18th, 1879, and January 20th, 1880.)

SIZE, or receiving Capacity. Inches.	Product per hour in Cubic Yards. (See Note.)	Weight of Heaviest Piece.	Weight of Timber Frame. Pounds.	Total Weight.	Extreme Dimensions. Length. Ft.	In.	Breadth. Ft.	In.	Driving Pulley. Diam. Inch.	Face. Inch.	Proper Speed.	Horse Power required.	Cash price delivered on board.
15 x 9	seven	2,480	1,400	12,860	9	0	5	0	24	10	275	9	
15 x 5	six	1,070	1,200	8,000	7	0	4	8	24	8	275	8	
15 x 2	....	295	325	2,690	4	6	4	0	16	5	3 0	3	
10 x 7	five	1 175	800	6,750	7	0	4	3	20	6	275	5	
10 x 4	three	300	375	2,850	5	6	3	9	16	5	300	4	
3 x 1¼	.....	.....	.....	125	1	8	1	0	.....	.....	.....	.....	

NOTE.—The amount of product depends on the distance the jaws are set apart, and the speed. The product given in the table is due when the jaws are set 1¼ inches open at the bottom, and the machine is run at its proper speed and diligently fed. But it will also vary somewhat with the character of the stone. Hard stone or ore that breaks with a snap, will go through faster than sand stone.

A cubic yard of Stone is about one and one-third tons.

☞In getting an Engine to drive one of these Crushers, it is advised to have one of greater power than just what is stated in the table as required. It is much more economical to use 9 horse power from a 12 or 15 horse than from a 9 or 10 horse Engine.

ADAPTATION OF THE DIFFERENT SIZES.

15 x 9.

This size is best adapted to general purposes. It is the size almost uniformly used for breaking for McAdam Roads, and Ballasting Railroads and for Concrete. They are also used extensively at Smelting Furnaces—also at Copper and other mines to take the product of the Coarse Breakers and reduce it to proper size for feeding under the Stamps.

15 x 5.

This is a suitable size when a large product is desired and the pieces to be broken do not exceed 4 to 5 inches in thickness.

15 x 2.

This machine is extensively used to reduce the product of larger Breakers from egg size down to corn grain size and dust. The product for quartz is from 1½ to 2 tons per hour. A valuable machine for sampling Ores, crushing Emery, Quartz, etc.

10 x 7.

Will receive pieces 7 inches in thickness and may be set to break down to ¾ inch. Will crush 50 cubic yards road metal per day. In general use where but 40 or 50 tons of ore per day are handled.

10 x 4.

This machine is very desirable on account of lightness of parts—no piece exceeding 300 lbs. in weight—will receive pieces 4 inches in thickness and crush to ½ inch, or less, if desired.

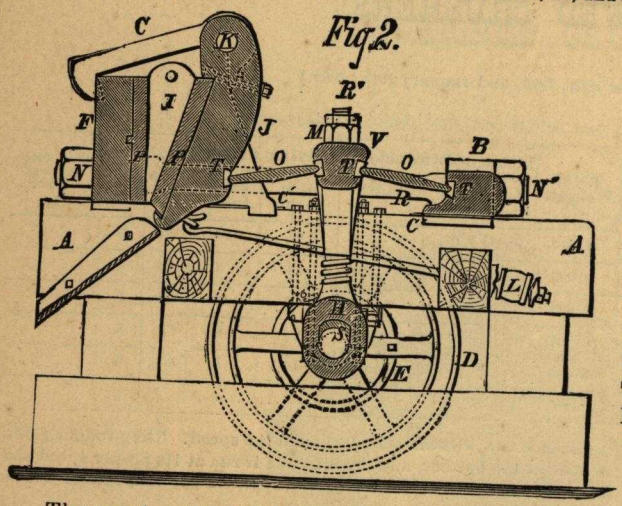
LABORATORY CRUSHER.

This is a small Hand Crusher, weighing about 100 lbs.; adapted to the use of Chemists, Assayers and Mineralogists, and frequently employed in Laboratories and Scientific Institutions. It is a complete model of the large Crusher, and very convenient for sampling and testing ores. It will receive pieces 1 inch thick and crush fine. Price $50, well boxed for shipment.

BLAKE'S CHALLENGE ROCK BREAKERS, OR, SECTIONAL CUSHIONED CRUSHERS.

(Patented November 18th, 1879, No. 221,768, and January 20th, 1880, No. 223,697.)

Fig 2.



LIST OF PARTS.

A. A. Timber Frame of Breaker. R. Main Tension Rods. F. Main Frame. R′ H. Pitman. J. Movable Jaw. R′. Pitman Rods. K. Jaw Shaft. M. Pitman Rod Nuts. C. Clamps. O. O. Toggles. I. Cheeks. S. Main Eccentric Shaft. P. P. Jaw Plates. D. Fly Wheels. N. N′. Main Tension Rod Nuts. L. Rubber Spring. C. C′. Rubber Cushion. H. Pitman Half Box. T. T. T. Toggle Bearings. E. Main Pulley.

The construction of the machine is shown in the engravings, and its operation will be readily understood. A three-sided framework of cast iron, with broad flanged base, holding the movable jaw in suspension, forms the front part of the machine, between the upright convergent jaws of which the stone is crushed.

The jaw shaft is held in place by wrought iron or steel clamps, C, which serve to take part of the strain due to crushing in the upper part of the jaw space, and also serve as walls thereof. In the lower part of the three-sided frame or front part of the crusher, and on each side of it, are holes in the casting to receive the main tension rods which connect the front and rear part of the machine. The rear part, B, is called the main toggle block, and is also provided with holes for the tension rods, R R, corresponding to those in the front casting.

These two parts of the machine are connected by the main steel tension rods, R R, each provided with screw thread and nuts, by which their lengths and the jaw opening are readily adjusted to crush coarse or fine, as may be desired.

The front and rear castings are supported on parallel timbers, to the under side of which are bolted the boxes carrying the main eccentric shaft, provided with fly wheels and pulley. The timbers are thus made component parts of the machine, and take the transverse strain which comes upon the pitman connecting the main shaft and the toggle joint placed in the rear of the movable jaw, and between it and the main toggle block.

Between the broad flanged bases of the front and rear castings and the timbers on which they rest, are placed flat rubber cushions one-quarter to three-eighths of an inch thick. Every revolution of the shaft brings the toggles more nearly into line, and throws the swing jaw forward; it is withdrawn by the rod provided with rubber spring, L. In this way a short reciprocating or vibratory movement is communicated to the movable jaw.

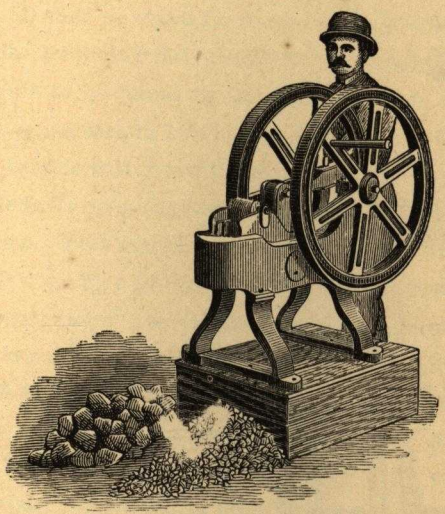
It is evident that this new construction of the Blake stone crusher—while the principle of crushing between upright convergent jaws is the same as in their old machine—possesses many and great advantages over the old forms. It is sectional. The weight of the heaviest piece in crusher size 15x9 inches is about 2,400 pounds, instead of nearly 8,000. The rigidity, inseparable from machines with cast iron frames, and which is the cause of frequent breakages, is completely overcome, and the longitudinal as well as transverse strains are brought upon materials which are strong and elastic as compared with cast iron. The rubber cushions, while offering sufficiently great resistance to compression in case of the breakage of stone or in doing the normal work of the machine, will, in case of the accidental intrusion of steel hammers or anything of that kind, be compressed and so permit the partial revolution of the fly wheels before coming to a full stop, thus relieving the machine of those nearly infinite strains to which those of the old form were subjected, and which resulted in breakage of important parts. The toggles are long and of equal length, and may be worn indefinitely, as compared with those in the old machine.

The construction of the pitman is such as to admit of change of inclination of the toggles, and consequently of adjustment of the length of stroke of the movable jaw. The jaw opening can be varied between any working limits by means of the nuts on the tension-rods, and the machine be set to crush coarse or fine, as may be desired. This Breaker can be run at a higher rate of speed with safety than either of the old forms of crusher with cast iron frames, and will consequently do a greater amount of work. It is very much lighter than the old forms, and has at least double their strength.

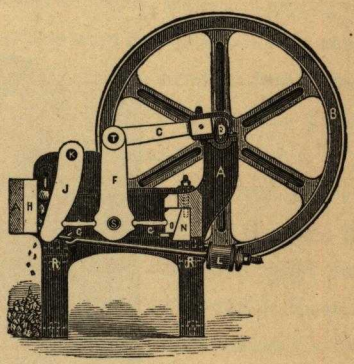
The new challenge rock breaker has been repeatedly subjected to the test of a steel hammer being thrown between its jaws, when going at as high a rate of speed as 300 revolutions per minute, without injury to or breakage of the machine.

BLAKE'S NEW PATENT HAND POWER STONE AND ORE CRUSHER.

(Patented August 29th, 1876.)



Perspective view of Hand Crusher.



Sectional view of Hand Crusher.

At the Centennial Exhibition the highest Medal was awarded to the Blake Crusher; and at the International Exhibition of Paris in 1878 it was awarded the Gold and Silver Medals.

This little machine is well worthy the attention of Manufacturing Chemists, Metallurgists, Assayers, Mining Schools, Concentration Works, etc. Being well fixed to receive a belt from power, it can be made quite effective in Mining and Manufacturing Works, and in the smaller establishments for smelting the higher grades of ores. Can crush from 400 to 600 pounds per hour worked by two men, and can also be worked by a belt from the driving shaft of a Steam Engine, Water Wheel or horse power.

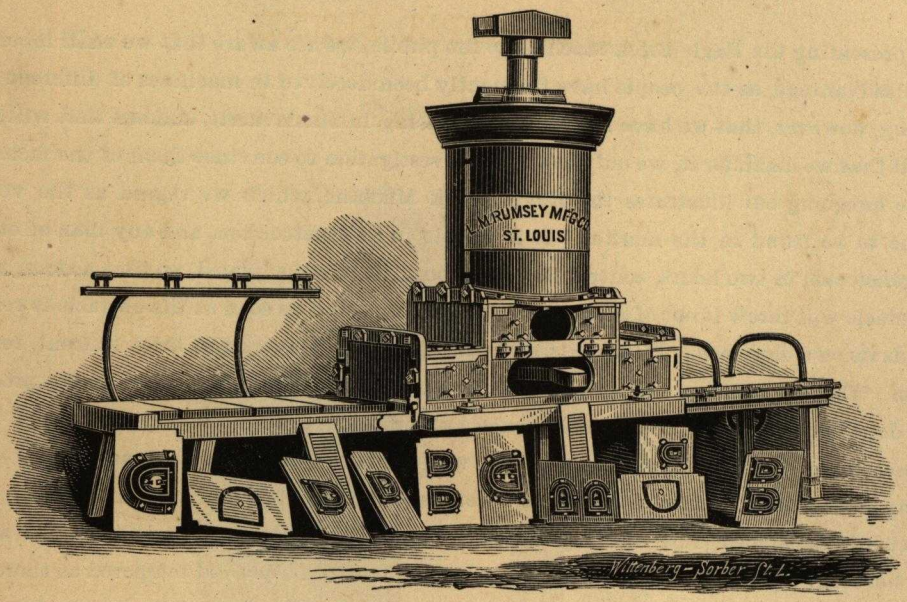
It will crush the hardest Iron, Silver, Copper, Gold, or other Ores, and reduce them to small fragments and dust with astonishing ease and facility. It is also well adapted for the purpose of crushing stone for Walks in private and public Parks and Gardens.

A machine of this kind supplies a need greatly felt in new mining districts. Many of these localities cannot be reached with heavy machinery, yet some means of crushing the ore is indispensable, in order to test and ascertain general averages, as well as to reduce the ore to a condition for sacking and packing out.

The Crusher weighs about seven hundred pounds, and has a receiving capacity of 4 x 2 in. It is made in parts of less than 200 pounds, to adapt it for transportation into mountainous regions on pack saddles, and wherever there are no roads for wheels. It can be taken wherever the miner can go with mules, and will be found of great use in the development and preliminary working of mines.

Write for prices.

IMPROVED TILE MACHINE.



We invite the attention of all parties interested in Drain Tile and machines for manufacturing the same, to our latest Improved Tile Machine, as shown in the above cut, and of which we make two sizes. We solicit a careful examination of the many very superior points of excellence combined in this machine, such as weight, strength, durability, finish and capacity.

These machines weigh, when complete, 4,500 and 5,000 pounds, and having been improved and strengthened wherever found weak, or experience could suggest an improvement, they now stand without an equal in the country for strength. We know them to be durable, as some of the machines that have been used for over nineteen years are still in use.

These machines are finished in the most thorough and workmanlike manner, every joint being made perfectly tight and even, by having the parts planed smoothly to a fit (no gaskets or paper put between to make a fit), so the bolts and set screws may be drawn as tightly as possible without straining the castings. The inside working parts of the machine are fitted so exact that the machine works as smooth as an engine.

The capacity of the small machine is from 1½ inches to 7 inches flat bottom Tile, and from 1½ inches to 6 inches any other shape. The capacity of the large machine is from 1½ inches to 9 inches flat bottom, and from 1½ inches to 8 inches any other shape. We can also furnish brick attachment for either size when wanted.

We would call especial attention to our manner of measuring Tile: When we say 9 inch flat bottom, or 8 inch round, we mean that the Tile will measure 9 inches and 8 inches inside after the Tile is burned, not green, as it comes from the machine. We ask especial attention to the following main improvements: The Upper or First Plunger and Screen are for tempering the clay and removing all gravel and hard substances, thereby preventing the breaking of Dies. The Adjustable Plates or Pads at the sides and bottom of the Plunger are for preventing leakage and taking up the water on the Plungers. The Collar or Bush on the upper part of the Main Shaft, working in the Arch, leaves the shaft full size, and without any bearing or journal turned on it to wear or weaken it. Also to the Bush Boxes in the bottom and top plates for the shaft to work in, the advantages of which cannot be overestimated; they not only prevent the plates from being worn by the shaft, but can be replaced at very little expense by new ones, thereby saving the expense of tearing the machine to pieces, and sending both the top and bottom plates with the shaft to the shop for repairs. We have also added for this year's machines a very neat Hopper, which supplies a want long felt in Tile Machines; also, Brackets or Shelves for tools, which are not only an ornament but very useful. We also manufacture Round Tile Machines, known as the Tiffany Tile Machine.

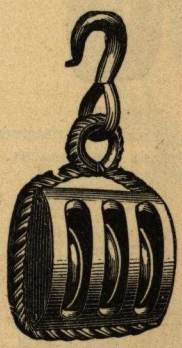
Improved Tile Machine, with 10 Dies, weight 4,500 pounds	$550 00
Tiffany Tile Machine for round Tiles	540 00

ROPE STRAPPED BLOCKS.

STEEL PINS. LIGNUMVITÆ, OR IRON SHEAVES.

SINGLE.
No. 85. With Common Lig. Sheaves.
No. 86. With Patent Lig. Sheaves.

DOUBLE.
No. 87. With Common Lig. Sheaves.
No. 88. With Patent Lig. Sheaves.



TRIPLE.
No. 89. With Common Lig. Sheaves.
No. 90. With Patent Lig. Sheaves.

If wanted with Iron Sheaves, prefix an 0 to regular number, thus, 085, etc.

Dimensions.			Iron Bushed. 85 87 89			Roller Bushed. 86 88 90		
Sheave.	For Rope.	Shell.	Single.	Double.	Triple.	Single.	Double.	Triple.
Inches.	Inches.	Inches.	Each.	Each.	Each.	Each.	Each.	Each.
2 x 1-2	3/8	3½	$0 75	1 35	1 85	1 15	2 25	2 75
2¼ x 10-16	3/8	4	0 85	1 50	2 00	1 30	2 50	3 50
3 x 13-16	5/8	5	1 00	1 70	2 30	1 50	2 75	4 25
3½ x 15-16	3/4	6	1 21	2 10	2 70	2 00	3 70	5 00
4⅜ x 1 1-16	7/8	7	1 42	2 45	3 10	2 35	4 35	5 85
5 x 1 3-16	1	8	1 95	3 25	4 15	3 00	5 60	7 75
5¾ x 1 3-16	1	9	2 20	3 90	5 10	3 40	6 40	8 70
6¼ x 1 5-16	1⅛	10	2 40	4 65	6 00	3 90	7 30	9 80
7⅜ x 1 5-16	1⅛	11	2 80	5 45	7 00	4 50	8 30	11 50
8 x 1 3-8	1¼	12	3 25	6 15	8 00	4 90	9 25	13 00

We still continue our former system of numbering blocks, and treat all wood shell blocks as having wood sheaves, unless otherwise specified. We have found it necessary, however, to provide for our large and fast increasing trade for blocks with iron sheaves, and instead of introducing an entire new set of numbers, we designate blocks with iron sheaves by prefixing a cipher to the old number. For example, No. 85 stands for a single rope strapped block with lignumvitæ sheave, common bushed, while 085 stands for same with iron sheave. In making orders, be sure and give us the length of block, as well as its number. No extra charge for regular blocks with iron sheaves with polished grooves.

INSIDE IRON STRAPPED BLOCKS.

COMMON HOOKS. LIGNUMVITÆ, OR IRON SHEAVES. IMPROVED THICK MIDDLES AND STEEL PINS.

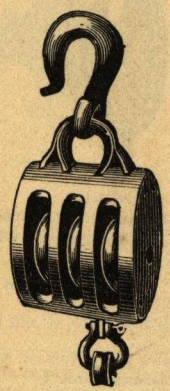
SINGLE.
No. 1. With Common Lig. Sheaves.
No. 2. With Patent Lig. Sheaves.

DOUBLE.
No. 3. With Common Lig. Sheaves.
No. 4. With Patent Lig. Sheaves.

TRIPLE.
No. 5. With Common Lig. Sheaves.
No. 6. With Patent Lig. Sheaves.

Becket.
SINGLE.
No. 7. With Common Lig. Sheaves.
No. 8. With Patent Lig. Sheaves.

Becket.
DOUBLE.
No. 9. With Common Lig. Sheaves.
No. 10. With Patent Lig. Sheaves.



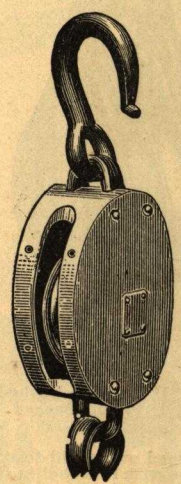
Becket.
TRIPLE.
No. 11. With Common Lig. Sheaves.
No. 12. With Patent Lig. Sheaves.

If wanted with Iron Sheaves, prefix an 0 to regular number, thus, 07, etc.

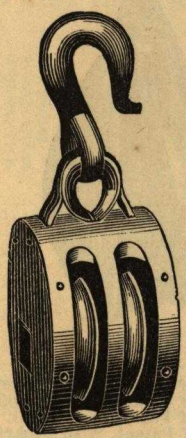
Dimensions.			Common Iron Bushed.			Patent Roller Bushed.		
Sheave.	For Rope.	Shell.	Single.	Double.	Triple.	Single.	Double.	Triple.
Inches.	Inches.	Inches.	Each.	Each.	Each.	Each.	Each.	Each.
2 x 1-2	⅜	3⅛	$0 85	1 70	2 50	1 25	2 50	3 50
2¼ x 10-16	½	4	1 00	2 00	3 00	1 50	2 90	4 00
3 x 13-16	⅝	5	1 35	2 70	3 50	2 00	3 80	5 50
3½ x 15-16	¾	6	1 70	3 00	4 15	2 50	4 55	6 55
4⅜ x 1 1-16	⅞	7	2 00	3 60	4 80	2 95	5 45	7 65
5 x 1 3-16	1	8	2 30	4 15	5 50	3 35	6 25	8 55
5¾ x 1 3-16	1	9	2 55	4 65	6 20	3 80	7 00	9 85
6¼ x 1 5-16	1⅛	10	2 85	5 15	6 90	4 20	7 80	10 95
7¾ x 1 5-16	1⅛	11	3 40	6 25	8 45	4 90	8 60	12 50
8 x 1 3-8	1¼	12	3 75	6 80	9 25	5 35	10 00	13 75
8⅝ x 1 3-8	1¼	13	4 35	7 80	10 75	6 15	11 50	16 00
9 x 1 1-2	1⅜	14	5 00	9 00	12 50	6 75	12 50	17 50
10 x 1 5-8	1½	15	5 75	10 50	15 00	7 25	13 50	19 50

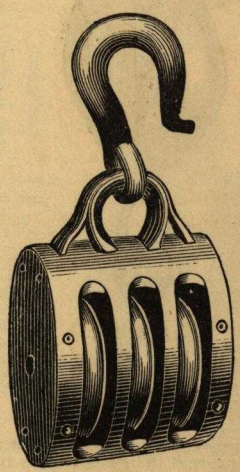
HEAVY TACKLE BLOCKS.

EXTRA STRONG HOOKS AND THICK MIDDLES, WITH HEAVY FLAT CHEEKS. EDGE BOLTED.



Becket and Thimble.





SINGLE.

No. 97. With Common Lignumvitæ Sheaves.
No. 98. With Patent Lignumvitæ Sheaves.

DOUBLE.

No. 99. Common, no Becket.
No. 99½. Common, with Becket.
No. 100. Patent, no Becket.
No. 100½. Patent, with Becket.

TRIPLE.

No. 101. Common, no Becket.
No. 101½. Common, with Becket.
No. 102. Patent, no Becket.
No. 102½. Patent, with Becket.

If wanted with *Iron Sheaves*, prefix an 0 to the regular number, thus, 097, etc.

DIMENSIONS.			COMMON IRON BUSHED.			PATENT ROLLER BUSHED.		
Sheave.	For Rope.	Shell.	Single.	Double.	Triple.	Single.	Double.	Triple.
Inches.	Inches.	Inches	Each.	Each.	Each.	Each.	Each.	Each.
3½ x 15-16	¾	6	$2 00	3 60	5 00	2 75	5 15	7 45
4⅜ x 1 1-16	⅞	7	2 35	4 30	5 85	3 25	6 10	8 70
5 x 1 3-16	1	8	2 70	4 95	6 75	3 80	7 15	10 00
5¾ x 1 3-16	1	9	3 00	5 55	7 55	4 25	7 90	11 25
6¼ x 1 5-16	1⅛	10	3 35	6 15	8 50	4 75	8 90	12 50
7⅜ x 1 5-16	1⅛	11	3 95	7 35	10 00	5 50	9 70	14 00
8 x 1⅜	1¼	12	4 40	8 00	11 15	6 10	11 35	16 00
8⅝ x 1⅜	1¼	13	5 00	9 10	12 70	6 80	13 25	18 25
9 x 1½	1⅜	14	5 70	10 40	14 60	7 50	14 50	20 00
10 x 1⅝	1½	15	6 50	12 00	17 25	8 50	16 50	22 50

Heavy Tackle Blocks are designed for work where *extra* strength and durability are required.

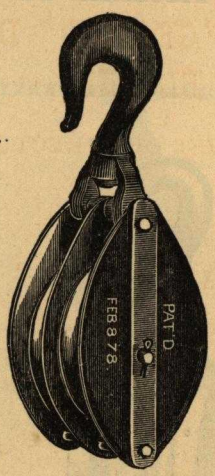
Can furnish with Patent All Steel Roller Bushed Sheaves, if required. Iron Sheaves never check or warp, and are fast taking the place of Lignumvitæ, especially for all heavy Railroad or Mining work.

WROUGHT IRON TACKLE BLOCKS.

IRON SHEAVES. (Patented February 8, 1876.)

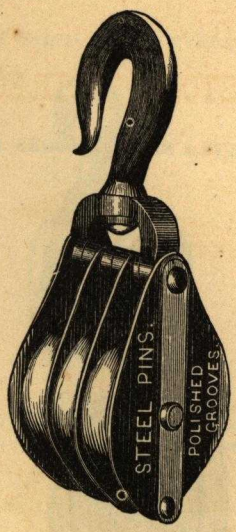
SINGLE.

No. 171. If Common Bushed.
No. 172. If Patent Bushed.



DOUBLE.

No. 177. If Common, no Becket.
No. 173. If Common, with Becket.
No. 178. If Patent, no Becket.
No. 174. If Patent, with Becket.



TRIPLE.

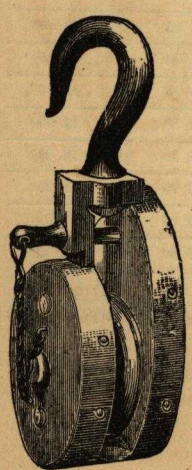
No. 175. If Common Bushed.
No. 176. If Patent Bushed.

Improvements consist in new design for shell, with wearing edges of shell rounded or turned out to add to strength and to prevent their fraying the rope, thus obviating the greatest objection ever made to blocks with iron shells; sheaves are of iron, with deep polished grooves, common bushed, or patent (anti-friction), all steel, roller bushed as ordered; pins are steel, turned to size, and are of uniform size for both common bushed and patent bushed sheaves, thus making sheaves interchangeable.

Sheave.	Rope.	Chain.	Shell.	Single.	Double.	Triple.
Inches.	Inches.	Inches.	Inches.	Each.	Each.	Each.
3⅛ x 11-16	⅛ to ⅝	.....	6	$ 2 00	$ 3 25	$ 4 00
4 x 13-16	⅝ to ¾	.....	7	2 75	4 00	5 00
4½ x 15-16	¾ to ⅞	.....	8	3 50	5 00	6 40
5 x 1 3-16	⅞ to 1	3-16	9	4 60	7 00	9 00
6 x 1 5-16	1 to 1¼	¼	10	5 30	9 00	11 50
7 x 1½	1¼ to 1⅜	5-16	12	6 50	11 50	14 75
8 x 1¾	1½ to 1⅝	⅜	14	9 00	17 00	23 00
9 x 2	1¾ to 1⅞	½	16	14 30	23 50	33 40
10 x 2¼	2 to 2⅛	9-16	18	24 50	45 50	59 00
11 x 2⅝	2¼ to 2⅛	⅝	20	33 50	57 75	74 00

SNATCH BLOCKS,

WITH SWIVEL HOOK.



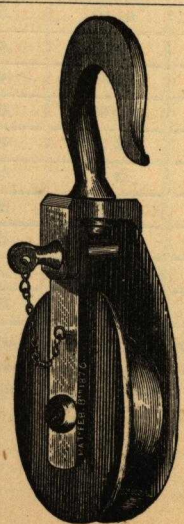
Size.	Rope.	Each.
Inches.	Inches.	Price.
6	⅞	$4 80
7	1	5 65
8	1	6 45
9	1⅛	7 90
10	1¼	8 80
12	1½	10 50
14	1¾	12 00
16	2	13 50
18	2⅛	18 00
20	2⅜	24 50

No. 111. Common Light Sheave.
No. 112. Patent Light Sheave.
No. 113. Common Iron Sheave.
No. 114. Patent Iron Sheave.

Wood Sides. Edge Bolted.

WROUGHT IRON SNATCH BLOCKS.

Patented February 8, 1876.



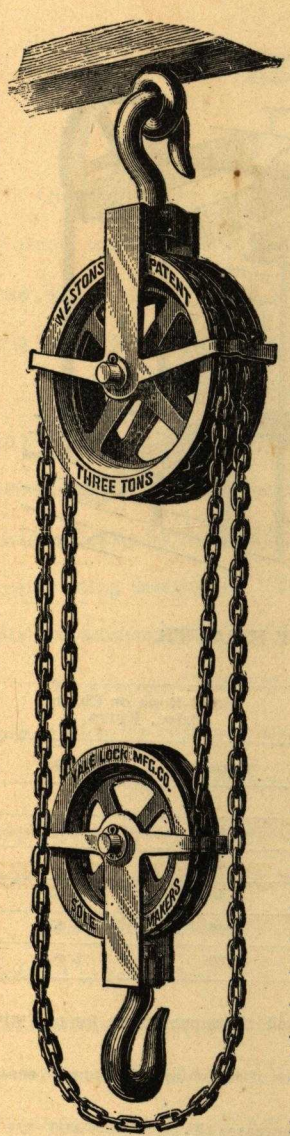
Size.	Rope.	Each.
Inches.	Inches.	Price.
7	⅞	$6 00
8	1	7 50
9	1⅛	8 50
10	1¼	9 50
12	1½	11 50
14	1¾	13 50
16	2	18 00
18	2⅛	23 00
20	2⅜	31 00

No. 179. Common Iron Sheave.
No. 180. Patent Iron Sheave.

Edges rounded to protect rope.

Iron Sheaves. Polished Grooves.

WESTON'S "DIRECT" AND "GEARED" DIFFERENTIAL PULLEY BLOCKS.



DIRECT

PRICE LIST OF DIRECT BLOCKS.

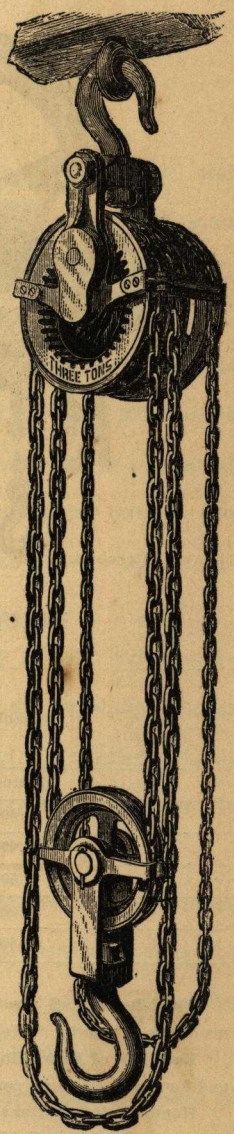
Capacity.	Price, complete with regular length Chains, Boxed.	Chain. Regular Length.	Chain. Extra Chain, Per Foot.	Hoist. See Note.*	Net Weight, Complete.
½ ton	$15 00	18 ft.	36 cts.	5 ft.	11 lbs.
¼ ton	20 00	22 ft.	38 cts.	6 ft.	22 lbs.
½ ton	25 00	26 ft.	40 cts.	7 ft.	30 lbs.
1 ton	30 00	30 ft.	44 cts.	8 ft	51 lbs.
1½ ton	40 00	33 ft.	48 cts.	8½ ft.	81 lbs.
2 ton	50 00	36 ft.	52 cts.	9 ft.	122 lbs.
3 ton	70 00	38 ft.	60 cts.	9½ ft.	173 lbs.

* NOTE.—Figures in fifth column denote approximate height which blocks, with regular lengths of chain, will hoist from level on which operator stands.

PRICE LIST OF GEARED BLOCKS.

Capacity.	Price, Complete with Chains, regular lengths, Boxed.	Chain. Regular length Main Chain.	Chain. Regular length Hand Chain.	Price of Extra Main Chain, Per Foot.	Hoist. See Note.*	Net Weight, Complete.
1 ton.	$40 00	22 ft.	16 ft.	$0 44	8 ft.	62 lb
2 ton.	65 00	24 ft.	18 ft.	52	9 ft.	109 lb
3 ton.	90 00	26 ft.	20 ft.	60	10 ft.	159 lb
4 ton.	120 00	28 ft.	22 ft.	70	11 ft.	257 lb
5 ton.	150 00	30 ft.	24 ft.	80	12 ft.	324 lb
6 ton.	200 00	32 ft.	26 ft.	1 00	13 ft.	493 lb
8 ton.	275 00	36 ft.	28 ft.	1 25	14 ft.	735 lb
10 ton.	350 00	40 ft.	30 ft.	1 50	16 ft.	1,054 lb

* NOTE.—Figures in sixth column denote approximate height which Blocks, with regular lengths of chain, will hoist from level on which operator stands.



GEARED

"DIRECT" BLOCKS.

One man can lift 1,000 pounds.

They hold the load at any point, and cannot run down.

Lifting and Lowering effected by pulling opposite sides of the slack chain.

EXTRA LENGTH OF CHAINS.—Allow about four feet of chain for each foot of extra hoist.

"GEARED" BLOCKS.

One man can lift from 2,000 to 5,000 pounds.

They hold the load at any point, and cannot run down.

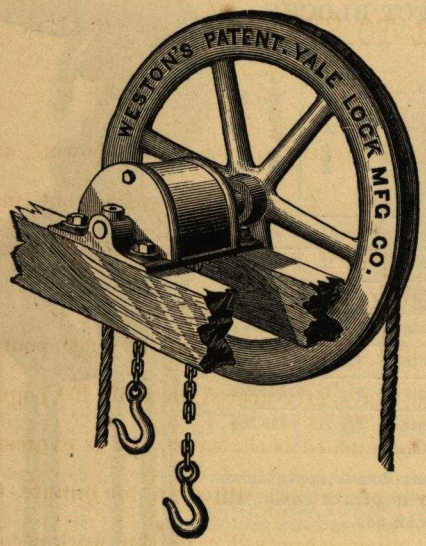
Easy and smooth in action—light and convenient to handle.

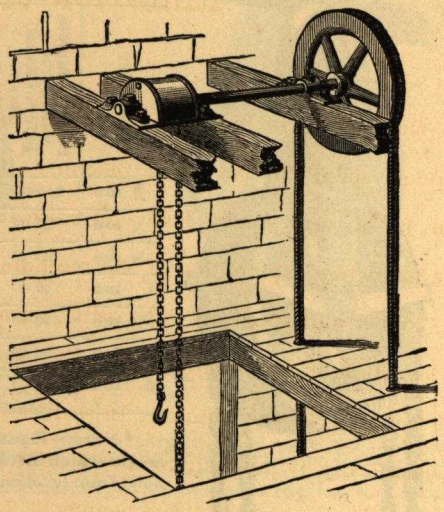
EXTRA LENGTH OF CHAINS.—For each foot of extra hoist allow two and-a-half feet of Main Chain, and two feet of Hand Chain.

EXTRA HAND CHAIN, 40 cents per foot.

WESTON'S PATENT SAFETY "DOUBLE LIFT" HOISTS,

FOR FACTORIES, STORES, MILLS, ETC.





PRICE LIST OF DOUBLE LIFTS, WITH SHORT SHAFTS.

No.	Capacity.	Height of Hoist.	Price Complete, Except Extra Hand-Rope or Chain.	Price for Extra Hoist, per Foot.	Hand-Rope or Chain, Price, Extra.	
					Rope.	Chain
	Pounds.	Feet.				
1	500	16	$25 00	0 40	3 00	5 00
2	1,000	24	50 00	0 44	4 00	7 00
3	1,500	28	65 00	0 48	4 50	8 00
4	2,000	32	80 00	0 52	5 00	9 00
11	500	16	30 00	0 40	3 00	5 00

Hand-Ropes and Chains are spliced, or endless (unless otherwise ordered), and of proper length for use with machines of regular "Height of Hoist."

Each foot of Extra Hoist requires two feet of Extra Hand-Rope or Chain, the prices of which are, for Rope, 6 cents, and for Chain, 14 cents per foot.

Hand-Chain is better than Hand-Rope, particularly, for short hoists. Its weight increases the steadiness and ease of motion, and it is less liable to kink than rope. It is well worth the slight difference in cost.

EXTRA LENGTH SHAFTS.

For first foot of extra length (including the additional bearing)	$2 00
For each additional foot	0 75

In ordering extra length Shafts, state distance desired from centre of hoistway to a line connecting the two rope holes through the floor. Numbers 2, 3 and 4 (geared), capacity of 1,000, 1,500 and 2,000 pounds.

RELATION OF POWER TO SPEED.

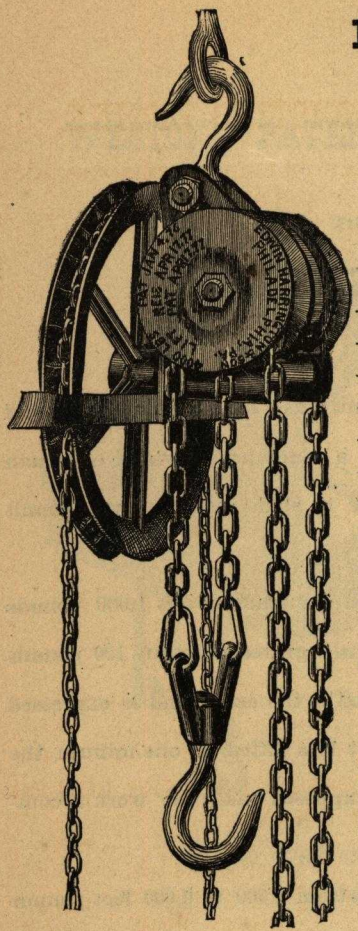
Our customers, in ordering hoisting machines, not infrequently ask for "great power" and "quick speed" in the same machine—that is, they call for a machine in which one man can lift a very heavy load and raise it quickly. In answer to such inquiries, we submit the following explanation of the mechanical facts involved:

Power and speed are convertible terms. A man may with one machine lift 1,000 pounds 10 feet high, in one minute, and with another machine, differently geared, may lift 100 pounds 100 feet high, in one minute. In each case the work accomplished is the same, and is expressed mechanically by multiplying the weight by the number of feet it is lifted in one minute, the result being designated "foot pounds." In each of the above supposed cases the work accomplished amounts to 10,000 foot pounds.

The average efficiency of a man working on a crank or rope is from 4,000 to 8,000 foot pounds per minute for ordinary work. These figures can be considerably increased during short periods.

A hoisting machine can be proportioned with any ratio of gearing desired. If wanted to hoist rapidly, it means that one man can lift only a small load. If wanted to hoist a heavy load, it follows that one man can raise that load only very slowly.

The ratio of gearing in our various hoisting machines is that which experience has demonstrated to be the best and most convenient for ordinary purposes. It is always such that the maximum load for which the machine is intended can be raised at the quickest speed which is possible with the number of men employed. When desired, we can usually (at some extra expense) vary the ratio of the gearing, but it must be remembered that any gain of speed is always accompanied by a corresponding loss of power, and any gain of power accompanied by a corresponding loss of speed. It is not possible, without an increase in the amount of power applied to the machine, to simultaneously increase both its power and speed.



HARRINGTON'S PATENT DOUBLE CHAIN SCREW HOISTING MACHINE.

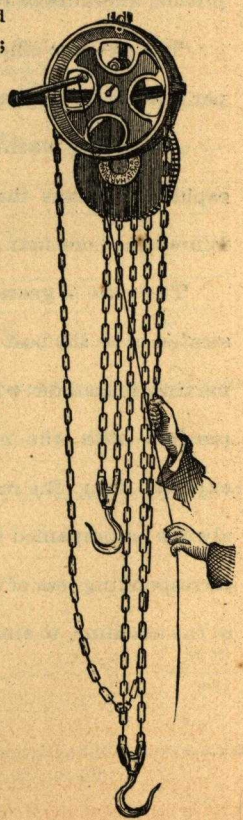
PRICE LIST.

In ordering Chains, allow four feet of Chain to each foot of lift.

Weight of Machine.	Lift.	To Raise.	Price.	Extra Lift, Per Feet.
Pounds.	Feet.	Pounds.		
35	8	500	$22 50	$1 00
52	8	1,000	25 00	1 20
65	8	2,000	30 00	1 50
76	8	3,000	40 00	1 75
140	9	4,000	60 00	2 00
226	10	6,000	75 00	2 20
258	10	8,000	95 00	2 40
625	12	10,000	140 00	3 00
750	12	12,000	180 00	3 75
875	12	16,000	260 00	4 75
925	12	20,000	340 00	6 00

Any part being broken or worn can be replaced at slight cost. Indispensable for Veterinary Surgeons, the Iron Foundry, Machine Shops, Stone-Cutters, Contractors, Builders, Blacksmiths, Horseshoers, Carriage Shops, Cotton and Woolen Mills, Farmers, Grocers, Steamships, Ship Yards, Railroads, Teamsters, Warerooms, Steam Forges, Butchers, Boiler-Makers, Bridge Builders.

Before Putting the machine to work, be sure and put in plenty of Oil so that the shaft will not run dry; put the oil in through the hole in top of case.



HARRINGTON'S PATENT DOUBLE CHAIN QUICK-LIFT HOISTING MACHINES

Are so arranged that they can be run at a rapid rate, either in hoisting or lowering any distance required. They are supplied with an efficient brake, for ease and safety in lowering the load. While the load is being raised with one end of the chain, the other end is descending for a fresh load. With the 1,500 Hoist, one man can lift 600 pounds 10 feet a minute; with the 1,000 pounds Hoist, 300 pounds 20 feet a minute. This is a desirable Hoist for the Warehouse, Factory, Teamster, Farmer, Builder, Butcher and all places where light work is to be done.

PRICES OF QUICK-LIFT HOISTS.

Hoist to lift 1,500 pounds 10 feet	$32 00
Extra Lift Chain, per foot	0 32
Extra Hand Chain, per foot	0 21
Hoist to lift 1,000 pounds 8 feet	30 00
Extra Lift Chain, per foot	0 30
Extra Hand Chain, per foot	0 20

One man can lift 250 to 15,000 pounds, according to size of machine.

PATENT FRICTION IMPROVED DRUM HOISTING ENGINE,

STATIONARY AND PORTABLE, WITH OR WITHOUT BOILERS. SINGLE OR DOUBLE CYLINDERS, AND FRICTION DRUM. FOR USE ON SAILING VESSELS, WAREHOUSE DOCKS, PILE DRIVING, MINES, QUARRIES, CONTRACTORS, ETC.

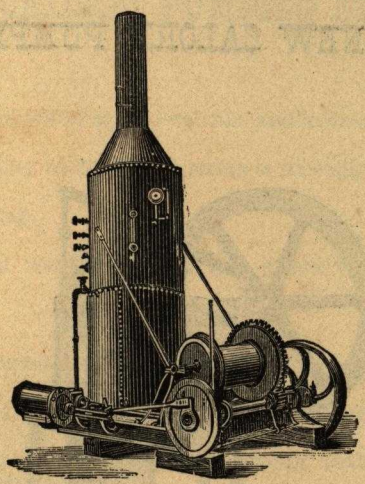


TABLE OF DIMENSIONS AND PRICES OF SINGLE CYLINDER ENGINES, BOILER AND FIXTURES COMPLETE. SINGLE DRUM.

Horse Power.	Boiler.		Tubes.			Cylinder.	Drum.	Revolut'ns Per Minute	Weight.	Hoist.	Prices.
	Shell.	Height.	No.	Size.	Length.	Bore and Stroke.	Diame'r of Drum.		Pounds.	Pounds.	
4	28 in.	4 ft. 6 in.	45	2 in.	30 in.	4½ in. x 10 in.	9 inch.	150	3,500	1,500	
6	30 in.	6 ft. 2 in.	50	2 in.	44 in.	5½ in. x 10 in.	12 inch.	150	4,000	2,000	
9	32 in.	6 ft. 4 in.	55	2 in.	48 in.	6½ in. x 12 in.	12 inch.	150	4,750	2,500	
12	34 in.	6 ft. 6 in.	60	2 in.	50 in.	7½ in. x 12 in.	12 inch.	150	5,250	3,500	
15	36 in.	6 ft. 8 in.	65	2 in.	52 in.	8½ in. x 14 in.	14 inch.	150	6,250	4,000	
20	38 in.	7 ft.	75	2 in.	56 in.	9½ in. x 14 in.	14 inch.	150	6,750	5,000	
25	40 in.	7 ft. 6 in.	85	2 in.	62 in.	10½ in. x 16 in.	18 inch.	135	7,500	6,500	
30	42 in.	8 ft.	95	2 in.	68 in.	11½ in. x 16 in.	18 inch.	135	8,000	8,000	

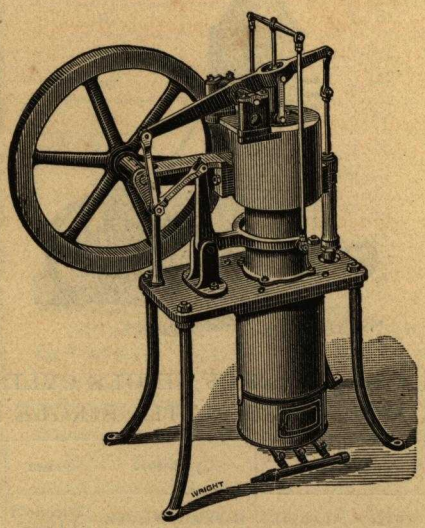
TABLE OF DOUBLE CYLINDER ENGINES, BOILER AND FIXTURES COMPLETE. SINGLE DRUM.

8	32 in.	6 ft. 4 in.	55	2 in.	48 in.	4½ in. x 10 in.	9 inch.	150	4,200	2,500	
12	32 in.	6 ft. 8 in.	65	2 in.	52 in.	5½ in. x 10 in.	12 inch.	150	5,000	3,500	
18	36 in.	7 ft.	75	2 in.	56 in.	6½ in. x 12 in.	12 inch.	150	6,000	4,500	
24	42 in.	7 ft. 6 in.	85	2 in.	62 in.	7½ in. x 12 in.	12 inch.	150	6,500	6,000	
30	44 in.	7 ft. 8 in.	95	2 in.	64 in.	8½ in. x 14 in.	14 inch.	150	7,500	7,500	
40	46 in.	7 ft. 10 in.	115	2 in.	66 in.	9½ in. x 14 in.	14 inch.	150	8,250	10,000	
50	48 in.	8 ft.	135	2 in.	68 in.	10½ in. x 16 in.	18 inch.	135	9,250	15,000	
60	52 in.	8 ft. 2 in.	160	2 in.	70 in.	11½ in. x 16 in.	18 inch.	135	10,000	20,000	

All Engines tried before leaving our works, guaranteed to be of first-class material, construction, and perfect. We warrant them to give entire satisfaction.

Engines furnished with Double Drums and Steam Pumps, if desired. Prices sent on application. Engines furnished with or without Boilers. Larger sizes made to order.

ERICSSON'S NEW CALORIC PUMPING ENGINE.



(Patented 1880.)

Ericsson's Caloric Pumping Engine is specially intended for domestic use in lifting and forcing water from wells and cisterns or from water pipes to tanks on upper floors of buildings in city or country.

This pumping engine is entirely safe, no steam being employed, and not liable to derangement. Can be operated and attended to by any one.

The following sizes will pump the number of gallons specified to a height of 50 feet, but they will pump more water to a lesser height, or less water to a greater height.

6-inch Cylinder, pumping 200 gallons per hour 50 feet, with Gas Furnace	$210 00
6-inch Cylinder, pumping 200 gallons per hour 50 feet, with Coal Furnace	220 00
8-inch Cylinder, pumping 350 gallons per hour 50 feet, with Gas Furnace	260 00
8-inch Cylinder, pumping 350 gallons per hour 50 feet, with Coal Furnace	275 00
12-inch Cylinder, pumping 800 gallons per hour 50 feet, with Coal Furnace only	375 00
Duplex 12-inch Cylinders, pumping 1,600 gallons per hour 50 feet, with Coal Furnace only	550 00

All kinds of fuel will answer for this engine, but coal-gas is preferable, the consumption being only 15 cubic feet per hour. Besides, gas is handier and cleaner than coal or other combustibles.

DIRECTIONS FOR SETTING UP AND OPERATING ERICSSON'S NEW CALORIC PUMPING ENGINE.

Place engine as near source of water as convenient; and in case of lifting the water, lift should not be more than 20 feet, or it may be 25 feet, if pump is directly over well. Have delivery and suction-pipe same size as on pump.

When water is lifted from well or cistern, put check-valve in suction-pipe just above strainer.

In case of using gas, the connection from the gas-main to furnace should be half-inch gas-pipe, with cock close by furnace. To light gas, hold lighted match at burner, then turn on the gas; shut off gas, and repeat, to insure that gas is burning with blue flame; this will avoid a slight explosion of gas, which will occur if gas is allowed to fill furnace.

When coal is used for fuel, use nut coal; and connect the furnace with flue by 3½ or 4-inch stovepipe provided with damper.

Regulate fire by damper so that it is kept at a moderate rate of combustion; a strong fire is not necessary, and is liable to burn bottom of cylinder. After fire is started, in ten or fifteen minutes engine may be started by giving the flywheel one or two turns by hand in the direction from cylinder at top of wheel.

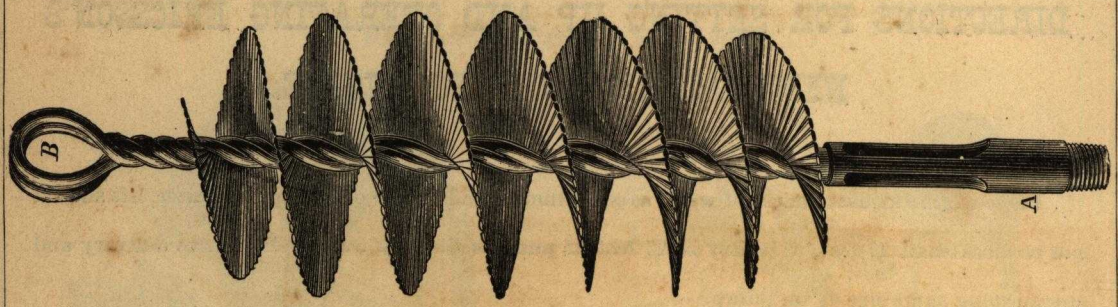
It is best that the engine should be stopped by allowing the fire to die out; but if stopped suddenly, the fire should be immediately drawn out of furnace.

Oil the working parts of the engine by applying a few drops in oil holes and sides of pin occasionally, when running steadily; or at starting only when machine is used an hour or so at a time. Lubricate cylinder all around with tallow or oil, but do not use too much of the latter, to prevent the formation of gum.

MARK: The power of this engine depends on keeping the upper part of the cylinder as cold as possible. Hence, if the starting is delayed until the heat from the furnace reaches the top, no useful effect will be produced. Besides, the piston may be injured by the over-heating of the upper end of the cylinder, caused by neglecting to start the engine in time.

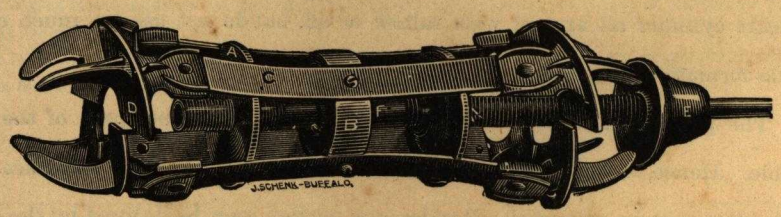
Set Machine as near level as possible.

STILLWELL'S PATENT BOILER FLUE BRUSHES.



Size.	Stillwell's Patent Steel Wire.
1 inch	
1¼ inch	$1 45
1⅛ inch	1 55
1¾ inch	1 70
2 inch	1 90
2¼ inch	2 10
2⅛ inch	2 30
2¾ inch	2 50
3 inch	2 80
3¼ inch	3 00
3⅛ inch	3 30
4 inch	3 75
4¼ inch	4 00
5 inch	4 25
5⅛ inch	4 50
6 inch	4 75
7 inch	5 50

THE "ENGINEER'S FAVORITE" DOUBLE ACTING BOILER FLUE CLEANER.

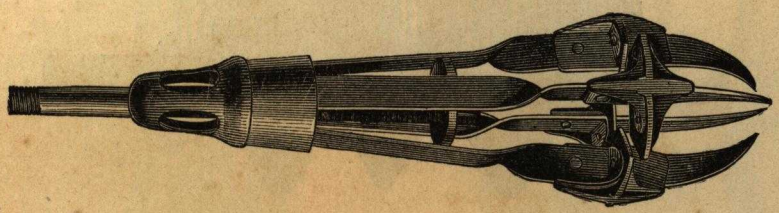


This is the most perfect flue cleaner ever invented. By simply turning the rod or handle, the ends contract until it will readily pass into the flue. Then by turning the handle in an opposite direction, the cleaner is gradually expanded until it fits the tube perfectly. Satisfaction guaranteed.

List price, per inch	$1 00

THE NATIONAL STEEL TUBE CLEANER.

SAVES FUEL! SAVES LABOR!



Patented July 28th, 1874.

SAVES FUEL.—Because it removes from the Boiler Tubes all Carbon and Scale—which, besides having an injurious effect on the metal of the Tubes, cause a loss ranging as high as 25 per cent., when the cleaning of the Tubes is neglected or imperfectly done.

SAVES LABOR.—Because this Tube Cleaner can be used much more effectively and with less effort than any other in use.

ADVANTAGES OVER OTHER CLEANERS.

It is simple in construction and of few parts, and so is not liable to get out of order like the complicated styles of Cleaners sometimes used.

It is strong and durable, being made of Spring Steel. Each segment is of itself a spring and distends in a perfect circle, so as to press against the inside of the Tube, removing all carbon and scale without the slightest injury to the Tubes. These points warrant us in guaranteeing the National Steel Tube Cleaner to clean better, last longer and work easier than any in the market.

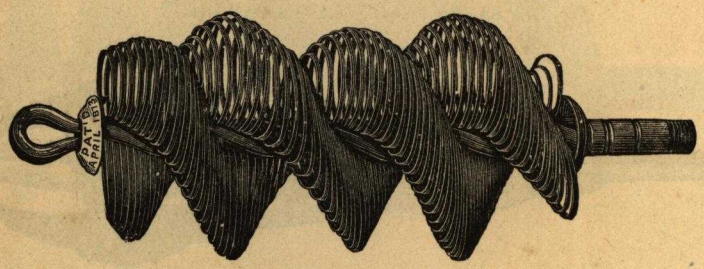
Adopted and in full use, after a severe test, by U. S. Navy, Pacific Mail and other Steamship Companies, and a large number of the most extensive manufacturing corporations in this and other countries.

Unlimited references furnished on application.

PRICE LIST.

1 inch	$1 00
1½ inch	2 00
1¾ inch	2 00
2 inch	2 00
2¼ inch	2 25
2½ inch	2 50
2¾ inch	2 75
3 inch	3 00
3¼ inch	3 25
3½ inch	3 50
4 inch	4 00
4½ inch	4 50
5 inch	5 00
5½ inch	7 00
6 inch	7 50

STEEL COIL WIRE BRUSH AND FLEXIBLE SCRAPER COMBINED.



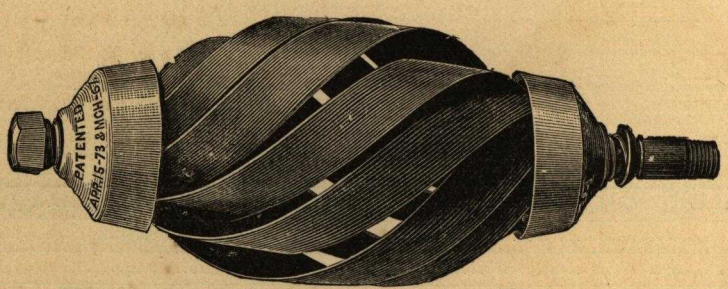
(Patented April 29, 1873.)

SIZES AND PRICES.

Size	1	1½	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Price	$1 00	1 10	1 10	1 20	1 30	1 40	1 50	1 65	1 75	1 90	2 00

This Spiral Scraper is made of the best Steel, and it is the only one that will remove the Scales without injuring the tubes, and do the work from one to three years.

ELLIPTIC SPRING TUBE SCRAPER.



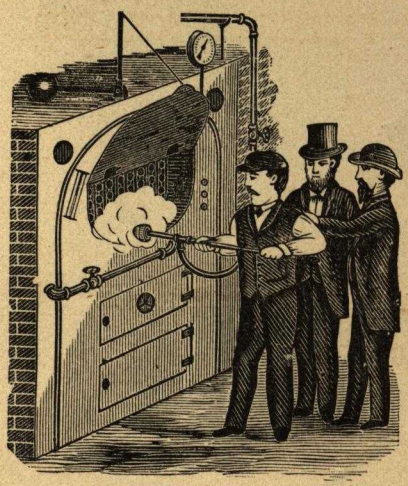
(Patented March 12, 1867, and April 15, 1873.)

SIZES AND PRICES.

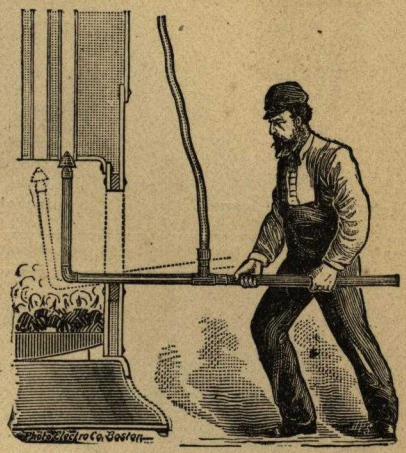
Size	1	1½	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Price	$2 00	2 00	2 00	2 25	2 50	2 75	3 00	3 25	3 50	3 75	4 00

This Spiral Steel Coil Brush and Scraper will do the most perfect cleaning, prevent Scaling, and do the work from one to two years.

ATCHISON & DOOLITTLE'S PATENT STEAM BOILER FLUE CLEANER.



Horizontal Boiler.



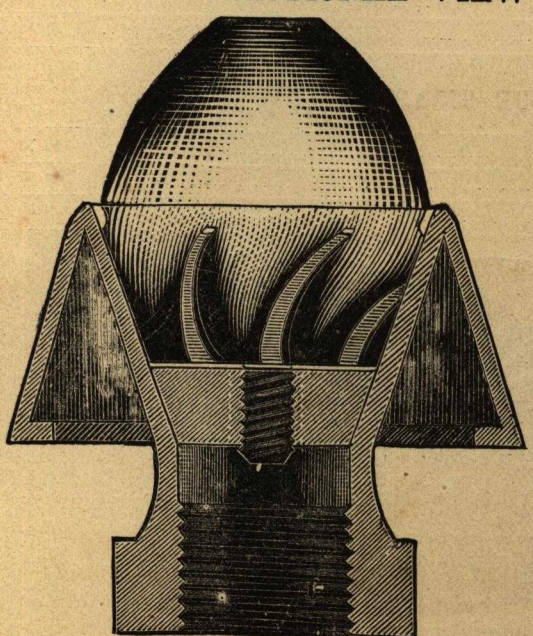
Upright Boiler.

PRICES.

No. 1, Takes Tubes measuring inside 1 inch to 1½ inches, requiring ⅛ inch hose	$ 7 00
No. 2, Takes Tubes measuring inside 1¾ inches to 2¼ inches, requiring ¼ inch hose	8 00
No. 3, Takes Tubes measuring inside 2¾ inches to 3¼ inches, requiring ¾ inch hose	9 00
No. 4, Takes Tubes measuring inside 3½ inches to 4 inches, requiring 1 inch hose	10 00
No. 5, Takes Flues measuring inside 4½ inches to 8 inches, requiring 1 to 1¼ inch hose	12 00
No. 6, Takes Flues measuring inside 8½ inches to 16 inches, requiring 1¼ inch hose	15 00

Nos. 5 and 6 made to order, from measure to fit special cases. (These prices do not include Hose.)

SECTIONAL VIEW OF BRASS HEAD.



DIRECTIONS FOR ORDERING.

1st. State the exact inside diameter of tubes.

2d. The pressure of steam used.

3d. If hose is wanted, state the length required, and we will attach same to Cleaner.

In ordering for Horizontal Boilers, state distances from tube sheet to front of boiler.

In ordering for an Upright Boiler, state the inside diameter of the Boiler and distance from bottom of door to tubes.

For large Upright Boilers, some prefer to have a rest made in about the middle of the door, instead of resting the Cleaner Pipe on lower part of door; in such cases measure from top of rest to tubes.

DIRECTIONS FOR CONNECTING AND USING THE CLEANER.

Should there be no pipe handy where the hose can be attached, make your connections from the dome of the boiler, or where you can obtain dry steam. Never make your connection smaller than the Pipe of Cleaner. Place a Globe Valve within easy reaching distance, open the valve lightly and blow out the condensed steam; then sweep off the front of the boiler, blowing the same up chimney; turn on steam and enter the Cleaner into the flues, leaving it in each but a few seconds.

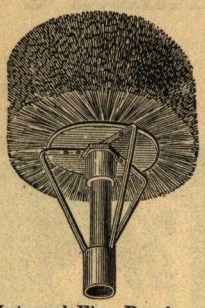
For prices of Steam Hose, see page 265.

STEEL WIRE BOILER SCRAPERS AND BRUSHES.

DAVIS' PATENT.

Internal Tube Cleaner.

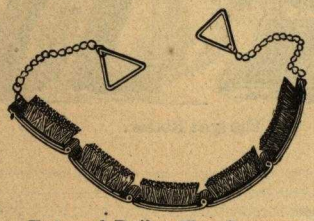
Internal Bottom Scraper.



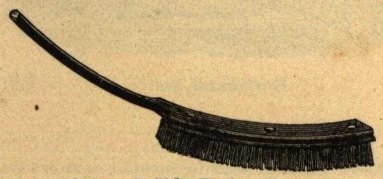
Internal Flue Brush.

Internal Flue Brushes, from 2 inch to 16 inch diameter, per inch	$1 00

INTERNAL BOILER SCRAPERS.



External Boiler Flue Scraper.

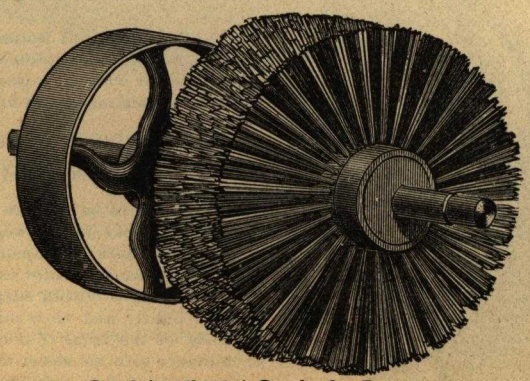


Internal Side Boiler Scraper.

28 and 30 inch Boiler, each	$4 00
32 and 34 inch Boiler, each	4 50
36 and 38 inch Boiler, each	5 00
40 and 42 inch Boiler, each	5 50
44 and 46 inch Boiler, each	6 00
48 and 50 inch Boiler, each	7 00
52 and 54 inch Boiler, each	8 00
60 and 62 inch Boiler, each	9 00
64 and 66 inch Boiler, each	10 00

EXTERNAL FLUE SCRAPERS.

10, 11 and 12 inch Flues	$3 75
13, 14 and 15 inch Flues	4 00
16, 17 and 18 inch Flues	4 50

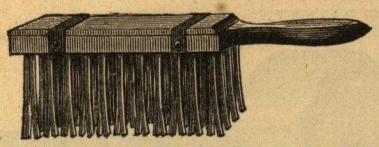


Revolving Casting Brush, for Power.

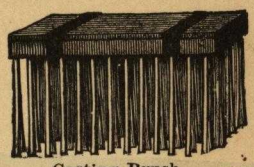
Revolving Brush for Cleaning Castings, adapted for 1¼, 1½ and 2 inch Shafts, 5 inches on face of Brush, $1 00 per inch per diameter, without Pulley, other sizes corresponding.

CASTING BRUSHES.

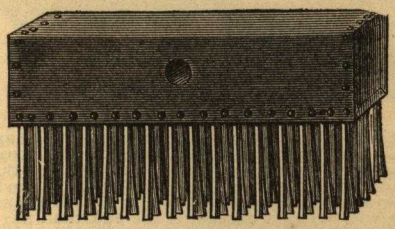
ROUND AND SQUARE, IRON STRAPPED.



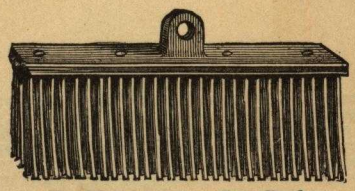
Casting Brush, with Handle, 50c. per doz. added.



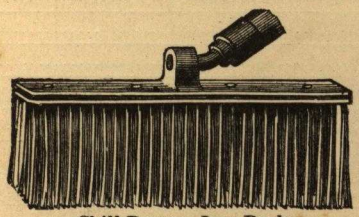
Casting Brush.



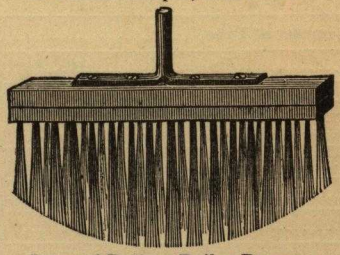
Hot Metal Scraper, Wood Back, Iron Bound.



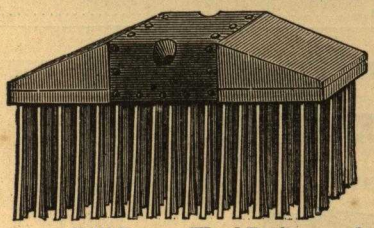
Hot Metal Scraper, Iron Back.



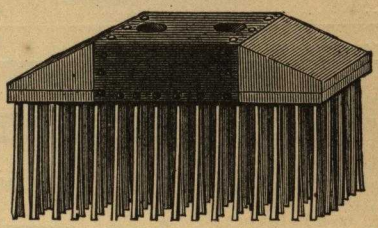
Chill Broom, Iron Back.



Internal Bottom Boiler Broom.

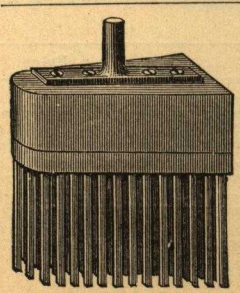


Chill Broom, Wood Back.



Sweeping Broom.

	Per dozen.		Per dozen.
Casting Brush, No. 1, 2 inch wire	$6 00	Hot Metal Scraper, Iron Back	$36 00
Casting Brush, No. 2, 2½ inch wire	6 50	Chill Broom, Iron Back	36 00
Casting Brush, No. 3, 3 inch wire	7 00	Internal Bottom Boiler Broom	24 00
Casting Brush, No. 4, 3¼ inch wire	7 50	Locomotive Broom	30 00
Casting Brush, No. 5, 4 inch wire	8 00	Chill Broom, Wood Back, No. 1	12 00
Casting Brush, No. 6, 4½ inch wire	8 50	Chill Broom, Wood Back, No. 2	15 00
Hot Metal Scraper, Wood Back, Iron B'd, No. 1.	20 00	Sweeping Broom, No. 1	12 00
Hot Metal Scraper, Wood Back, Iron B'd, No. 2.	24 00	Sweeping Broom, No. 2	15 00
File Cleaner	4 00	Internal Side Boiler Scraper, each	2 00



Locomotive Broom.

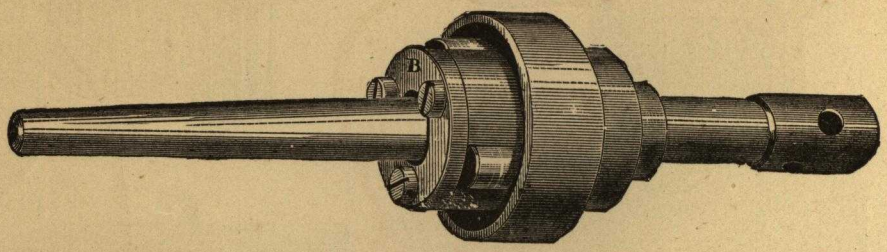
In writing for information in any line of these Brushes, please give dimensions, or for what purpose they are required, if not on the list, and you will receive a prompt reply.

File Cleaner.

Round Casting Brush.

ROLLER TUBE EXPANDER.

R. DUDGEON'S PATENT.



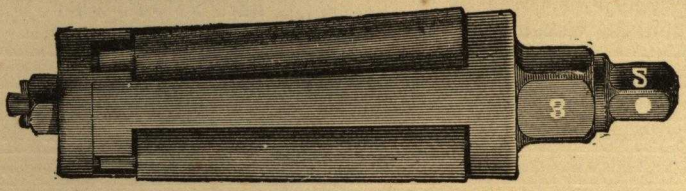
By means of this Expander the Tubes can be expanded without striking a blow on them, thus rendering them far less liable to crack. Leaky ones can be tightened, with steam on the boiler, with perfect safety. One Expander will answer for any thickness of Tube Sheet, thus avoiding the necessity of an Expander for each different thickness of sheet. They are no more liable to break than the common Tool, and are much more easily kept in order, as the Rollers are the only thing that can give out, and they can be replaced in a few moments by unscrewing cap B. We are prepared to furnish any size from 1 to 7 inches, at the following prices, which will be found cheaper in the end than any tool now in use:

Outside Diameter of Tube	Price.
1 inch	$20 00
1¼ inch	20 00
1⅛ inch	20 00
1¾ inch	25 00
1⅞ inch	25 00
2 inch	30 00
2¼ inch	35 00
2⅛ inch	42 00
2¾ inch	48 00

Outside Diameter of Tube	Price.
3 inch	$55 00
3¼ inch	60 00
3½ inch	70 00
4 inch	85 00
4½ inch	100 00
5 inch	120 00
6 inch	130 00
7 inch	180 00

ROLLER TUBE EXPANDER.

COLLINS' PATENT.



This Expander is recommended as superior to all other tools heretofore used for the same purpose. The rollers being placed at a small angle with the frame, it acts on the principle and has all the power of the Screw, making this Expander the best ever invented for Power, Speed, Durability and Simple Construction. Compare the prices with those of other Roller Expanders.

DIRECTIONS FOR USE.—In using apply the power to the square end of the Frame (8), or to the square end of the Central Spindle (2) and turn to the right, when the Tool will feed itself, and enter the Tube, expanding it to the required dimensions with the greatest ease. For quick work, turn the large square, or end of Frame (8). For greater power, turn the small square, or end Central Spindle (2). To withdraw, turn to the left. All hammering or driving unnecessary and forbidden. Do not cover the Rollers with grease or oil. For repairing, or for tubes that have been used or weakened, it cannot be equaled, as the expansion is so smooth, even and uniform, that it never breaks the fibre of the iron. Leaking tubes can be tightened when steam is on, with perfect ease and safety. It will answer for any thickness of Tube Sheet.

Outside Diameter of Tube	Price.
1¼ inch	$14 00
1¾ inch	16 00
1⅞ inch	16 00
2 inch	18 00
2¼ inch	22 50
2⅜ inch	25 00

Outside Diameter of Tube	Price.
2½ inch	$25 00
2¾ inch	27 00
3 inch	30 00
3¼ inch	35 00
3½ inch	40 00
4 inch	45 00

These dimensions refer to the external diameter of Tube.

BLACKSMITHS' BELLOWS.

SUPERIOR — DOUBLE RIBBED.

36 inch	$23 00	44 inch	$36 00
38 inch	26 00	46 inch	45 00
40 inch	29 00	48 inch	48 00
42 inch	32 00	50 inch	55 00

These large sizes are double ribbed, double battoned, and are bolted throughout in the most substantial manner possible; have extra spread of leather, thus giving a long and strong blast.

SUPERIOR — EXTRA.

22 inch	$ 8 00	32 inch	$12 50
24 inch	8 50	34 inch	14 00
26 inch	9 00	36 inch	15 00
28 inch	10 00	38 inch	17 00
30 inch	11 50	40 inch	19 00

SUPERIOR.

22 inch	$ 7 50	32 inch	$11 50
24 inch	8 00	34 inch	12 50
26 inch	8 50	36 inch	13 00
28 inch	9 50	38 inch	16 00
30 inch	10 50	40 inch	17 50

These Superior Brands are strongly and neatly made; they chamber more air, give a stronger blast than any other, and are the only Bellows made that are covered with Beef Leather.

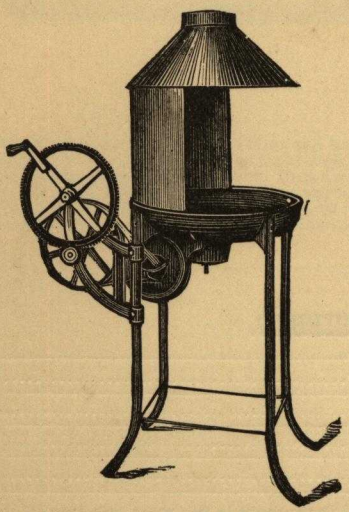
SHORT PATTERNS.

22 inch	$ 5 50	30 inch	$ 8 00
24 inch	6 00	32 inch	9 00
26 inch	6 50	34 inch	10 00
28 inch	7 00	36 inch	11 00

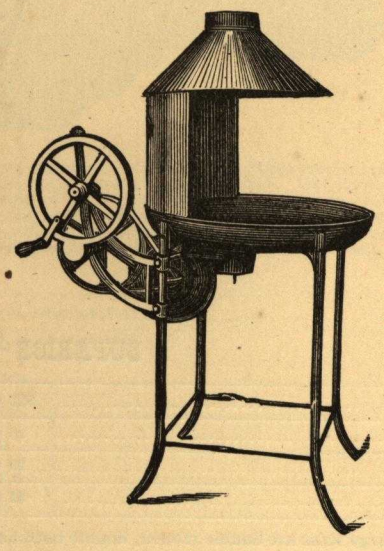
All sizes under 30 inches, without rib. No Common Bellows made larger than 36 inches. In ordering, be positive to state the kind you want.

WATSON'S PATENT PORTABLE FORGES.

WE WARRANT ALL OUR PORTABLE FORGES TO GIVE A STRONGER BLAST THAN ANY FORGE IN THE MARKET.



No. 1.



No. 2.

No. 1 Forge is adapted for the use of Farmers, Jewelers, Gunsmiths, Boiler-Makers, Plumbers, and all other purposes for which Forges are used.

This Forge is warranted to give perfect satisfaction in every case.

No. 2. Forge is same as No. 1, except it is larger.

PRICES.

Forge No. 1, with Hood	$25 00
Forge No. 1, without Hood	23 00
Forge No. 2, with Hood	30 00
Forge No. 2, without Hood	28 00

SIZES.

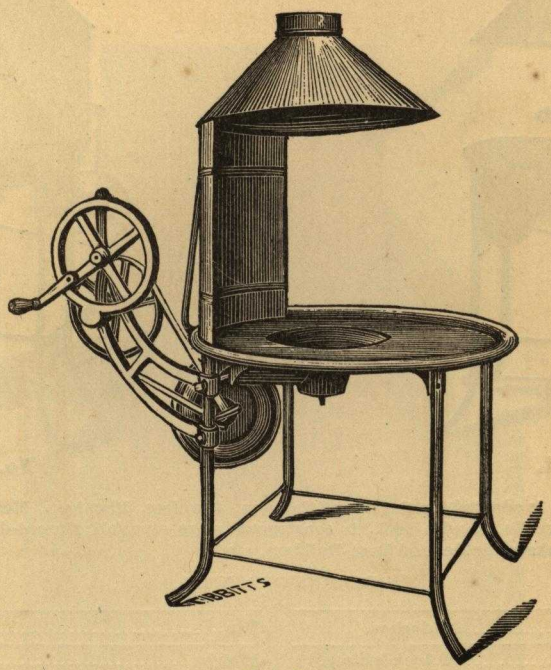
Forge No. 1.

Height	30 inches.
Fire Pan	20 inch diameter.
Fan	7⅛ inches.
Weight	83 pounds.

Forge No. 2.

Height	30 inches.
Fire Pan	34 inches.
Fan	8½ inches.
Weight	105 pounds.

WATSON'S PATENT PORTABLE FORGES.



No. 4.

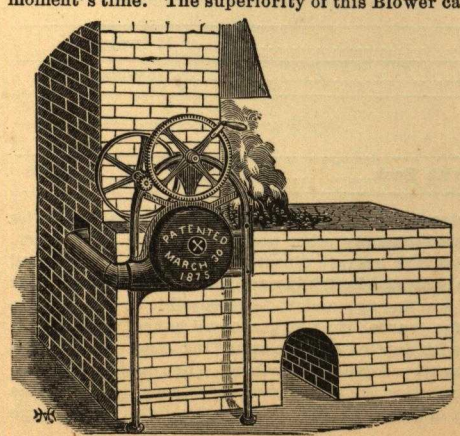
This size is large enough for any common Blacksmithing. Gives as strong a blast as any bellows that cost $40 00. It is portable, and, as will be seen, occupies but little room.

Price, with Hood	$45 00
Price, without Hood	40 00

Height, 28 inches; Fire Pan, 30x40 inches; Fan, 11½ inches; Weight, 165 pounds.

WATSON'S PATENT FORGE BLOWER.

This cut represents the Blower set up ready for use. It is made of the best material, with steel shafts and brass boxes. The boxes are so arranged that they can be removed by simply loosening a set screw, and replaced in a moment's time. The superiority of this Blower can be readily seen.

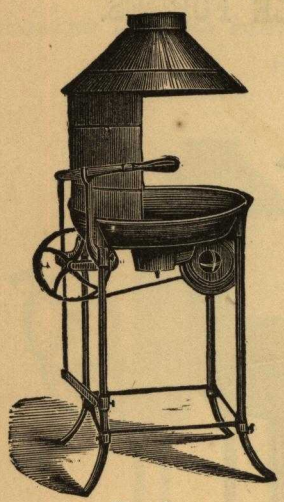


1. It costs less.
2. It will last longer.
3. It gives a perfect steady blast.
4. It takes less labor.
5. It gives stronger blast.
6. It heats one-third quicker.
7. Fire will not go out, as the fan allows the air to pass through the tuyere iron from natural draft.
8. It is noiseless.
9. All the parts can be duplicated at any time, at trifling cost, and put in by any one.
10. It occupies but little space.
11. It cannot blow up.

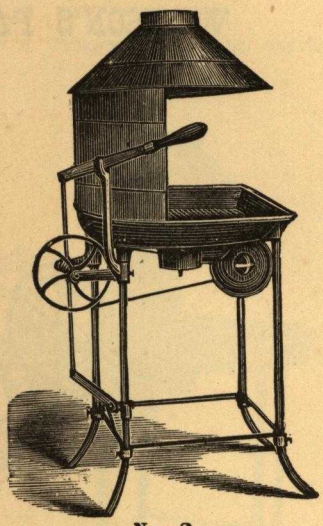
Warranted to give perfect satisfaction, if used with a Tuyere Iron.

Price	$23 00
Price, with Tuyere Iron	25 00

HOLT PORTABLE FORGE.



No. 1.



No. 2.

Forge No. 1, with Hood, is adapted for the use of Farmers, Jewelers, Plumbers, Mechanics, and all purposes for which forges are used. Forge No. 1, with back, is constructed more especially for out-door work, and is adapted for the use of Miners, Boiler-Makers, Bridge and Boat-Builders, etc.

DIMENSIONS, NO. 1.

Height	30 inches.	Fan	8 inches.
Fire Pan	21 inches diam.	Weight	90 pounds.

PRICES.

No. 1, with Back	$28 00	No. 1, with Hood	$30 00

DIMENSIONS, No. 2.

Height	30 inches.	Fan	10 inches.
Fire Pan	21x27 inches.	Weight	100 pounds.

PRICES.

No. 2, with Back	$33 00	No. 2, with Hood	$35 00

Forge No. 4 is large enough for any ordinary blacksmithing. It is portable, occupies but little space and gives a very strong and steady blast.

DIMENSIONS, No. 4.

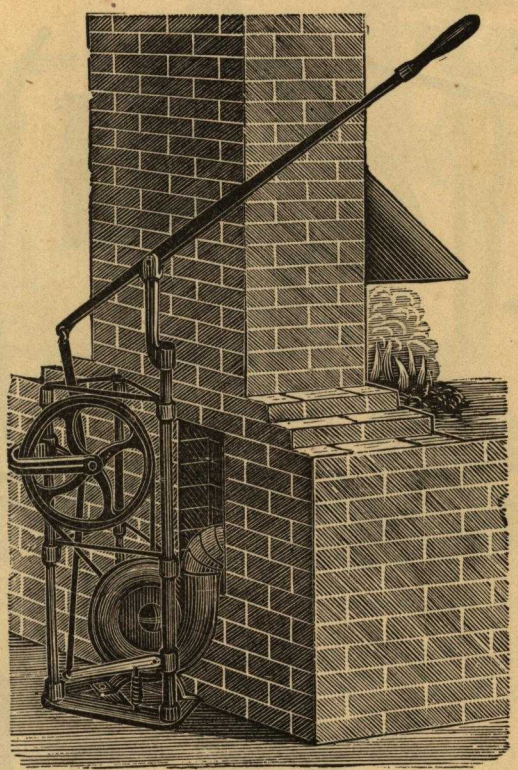
Height	28 inches.	Fan	12 inches.
Fire Pan	30x40 inches.	Weight	175 pounds.

PRICES.

No. 4, with Hood	$45 00	No. 4, with Back	$40 00

The Holt Portable Forge is celebrated for being light, compact, strong, simple and durable. It is noiseless in its operation, gives an extra strong and heavy blast, and is easier operated than any other portable forge in the market. The power is applied to a lever, which causes a simple and durable clutch to operate direct upon the hub of the band wheel, from which a 1-inch flat belt runs to drive the fan. No power is wasted in driving extra wheels, nor are there any gears to wear or rattle. There is no dead centre to overcome the starting up, and it is impossible to revolve the fan backward. The journals are made of the best of steel. The fan journal runs in gun metal boxes, which are so arranged that they can be removed in a moment's time and replaced with duplicate boxes at trifling cost. The weight is equally divided between front and rear, rendering it less liable to be tipped over and broken. The running parts are under the forge pan, and protected from cinders or danger of breakage. For the above advantages, combined with the beauty of design, first-class mechanical workmanship, and cheapness in price, the Holt Forge is the only Perfect Forge made.

HOLT FORGE BLOWER.



The above cut represents the Forge Blower set up ready for use. It stands directly behind and close up to the Forge. The lever projects past the corner, and when not in use flies up and back out of the way. The Blower is so constructed that by raising the bracket or the sleeve for lower lever the belts can be tightened immediately without unlacing. A distinct feature of the Holt Forge Blower, is that the blast does not stop as soon as you let go of the lever; but the fan will continue to blow for some moments, thus allowing plenty of time to remove iron from fire. The superiority of this Blower can be readily seen:

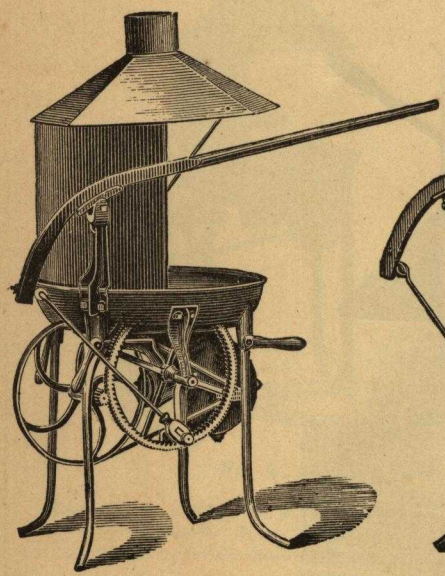
1. It costs less.
2. It will last longer.
3. It gives a perfectly steady blast.
4. It takes less labor.
5. It gives a strong blast.
6. It heats one-third quicker.
7. Fire will not go out, as the fan allows the air to pass through the Tuyere iron from natural draft.
8. It is noiseless.
9. It cannot blow up.

Warranted to give perfect sstisfaction, if used with our Tuyere Iron.

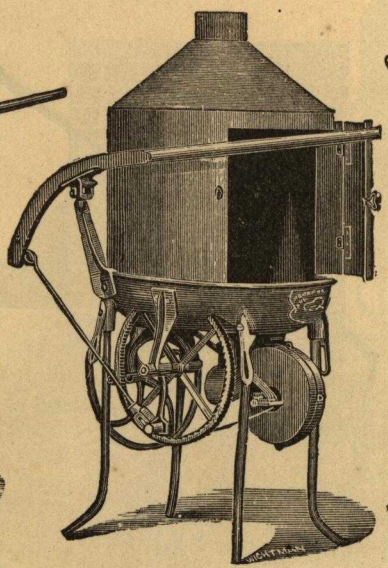
Price	$23 00
With Tuyere Iron	25 00

BUFFALO PORTABLE FORGES AND BLACKSMITHS' HAND BLOWERS.

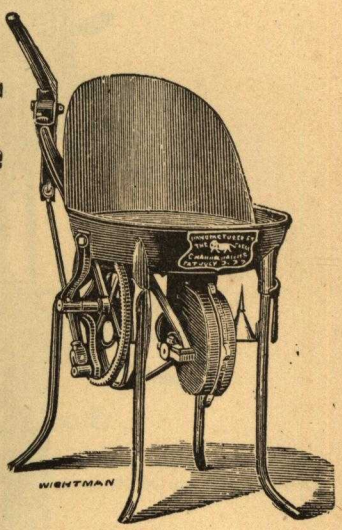
(C. Hammelmann's Patent, July 3, 1877.)



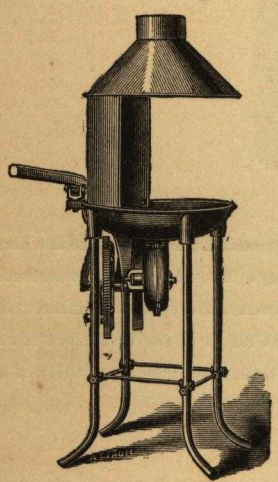
Forge No. 1.



Forge No. 2.



Forge No. 3.



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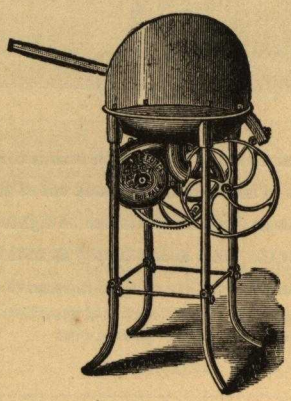

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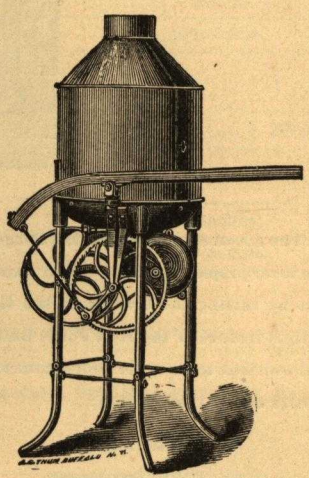


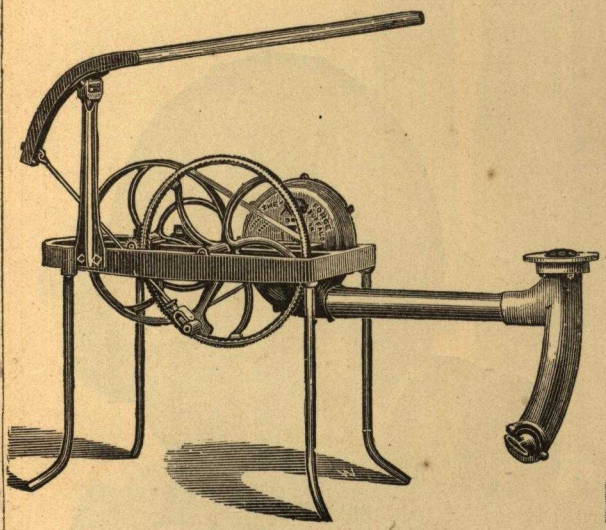
Forge No. 6.

Among the many points of superiority of the Buffalo Forge over all others, are strength, lightness, durability, workmanlike manner of construction, powerful blast, and ease with which same is operated. A glance at the cut will show the principle of their construction and the manner of operating. It is entirely new. There is no dead centre to overcome when starting up, and it is impossible to revolve the fan backwards. In operating it, one is not obliged to get down close to the fire and turn a crank in order to get his blast, but the movement of the lever (which requires but little power) in the Buffalo Forge, to drive the fan, is much like that of ordinary bellows, and being fixed on a swivel joint, has that easy motion which makes the work of operating it play instead of hard work. It also allows the operator to move about his fire on a radius of from three to six feet or more (according to size), without interrupting the blast. The machinery is all attached to the hearth, which makes it very compact. The legs are wrought iron pipe, and are screwed firmly into cast iron sockets projecting from the hearth. The working parts being entirely under the hearth, they are protected from cinders or danger of breakage.

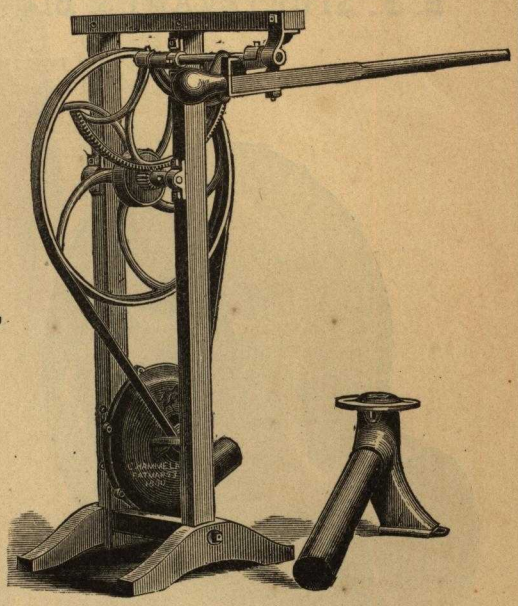
	Size of Fan.	Size of Hearth.	Height of Fireplace.	Weight.	Price.
Letter A, No. 1, Half Open Hood	8 inch.	21 x 27 inch.	29 inch.	150 pounds.	$40 00
Letter A, No. 2, Entirely Closed Hood	8 "	21 x 27 "	29 "	155 "	42 00
Letter A, No. 3, with Dash	8 "	21 x 27 "	29 "	148 "	36 00
Letter A, No. 4, Half Open Hood	6 "	18 in. diameter.	33 "	75 "	27 00
Letter A, No. 5, with Dash	6 "	18 " "	33 "	70 "	24 00
Letter A, No. 6, Entirely Closed Hood	6 "	18 " "	33 "	80 "	30 00

THE BUFFALO BLACKSMITHS' HAND BLOWERS.

ADAPTED FOR THE USE OF BLACKSMITHS IN GENERAL. MADE RIGHT AND LEFT HAND.



(C. Hammelmann's Patent, July 3, 1877.)



(C. Hammelmann's Patent, March 23, 1880.)

Blower No. 2, with Tuyere complete	$32 00
Blower No. 2, without Tuyere	30 00

Blower No. 3, with Tuyere complete	$25 00
Blower No. 3, without Tuyere	23 00

Our Hand Blowers are especially designed for all blacksmiths' purposes, for which we claim they far supersede the old-fashioned bellows, which is still worked, with all its tiresome encumberments and inconvenience. Others claim to have improved this highly important machine, but practical tests have easily demonstrated how far they have fallen short. From the generous reception given our Blower, and the many kind expressions and commendations which an earnest endeavor to please and satisfy has elicited, it is evident that we are right in saying they are the only perfect Blacksmiths' Hand Blowers made.

The Buffalo Blowers, unlike all others, are operated by means of a simple lever, which has the swivel motion, most natural to the blacksmith, and does not tire him. Another distinct feature of the Buffalo Blower is, that the blast does not stop as soon as you let go of the lever, but the fan will continue to blow for some minutes, thus allowing plenty of time to remove iron from the fire. Each Blower is supplied with one of our improved Tuyere Irons, which we advise to be used with the Blower.

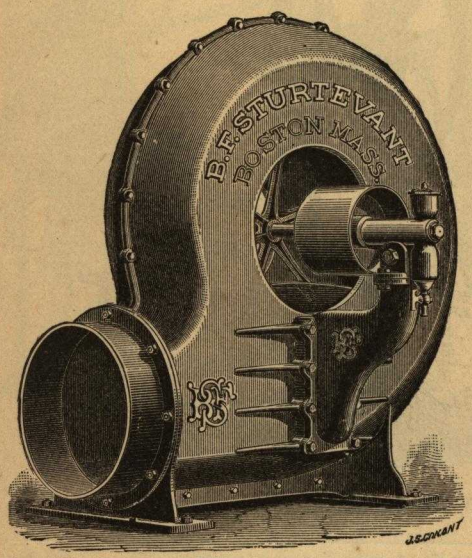
Blower No. 2 is operated same as the Buffalo Forge, and is so simple in its construction, that, by reference to the above cut, one can easily understand its manner of operating.

Blower No. 3 is of an entirely new design, and is so simple in its construction, the operation so easy, the speed and efficacy so great, as to be truly marvelous. Their many points of evident superiority render their use almost a necessity in every shop where intelligent and progressive blacksmithing is conducted.

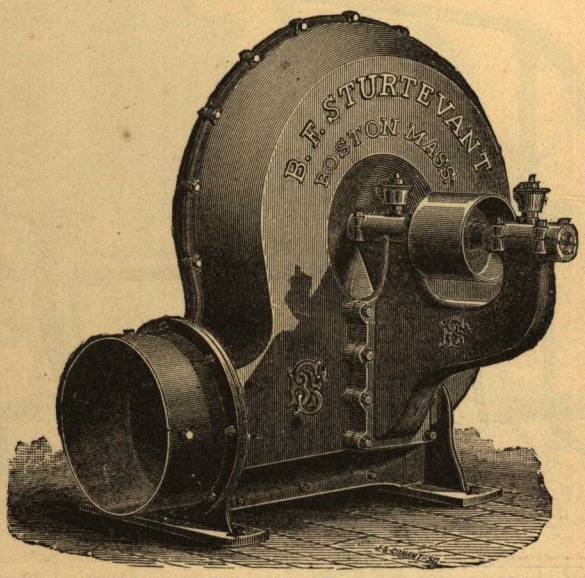
The accompanying cut shows the whole Blower with its lever in position, on a simple upright frame and fly-wheel. The latter revolves on a dead or fixed shaft. The impact is given to the fly-wheel by means of a number of pawls, piveted to the plate, having a pinion engaged by the segment-wheel shown. These pawls act upon a ratchet casing, and are connected with the pawl-plate in such a manner that, when the handle is lifted, the pawls are positively disengaged, and when depressed, as positively engaged with the ratchet casing. By this construction the fly-wheel is enabled to make many revolutions by one single pressure of the handle, which will allow to keep the fan in motion without fatigue, and give plenty of time, between the successive strokes, to handle the iron operated upon, without abating the blast. It gives a strong, steady blast, with but little labor. It takes less room, and has all the advantages of the old-fashioned bellows, in that the blast continues for a time after the lever is at rest. It is the best, cheapest, most effective and positive Blower made, and is guaranteed to give perfect satisfaction in every respect, if used with our Tuyere. We offer the goods to our patrons and others with the utmost confidence.

B. F. STURTEVANT'S BLOWER AND EXHAUSTING FAN.

KNOWN AS THE MONOGRAM PATTERN.



Blower.



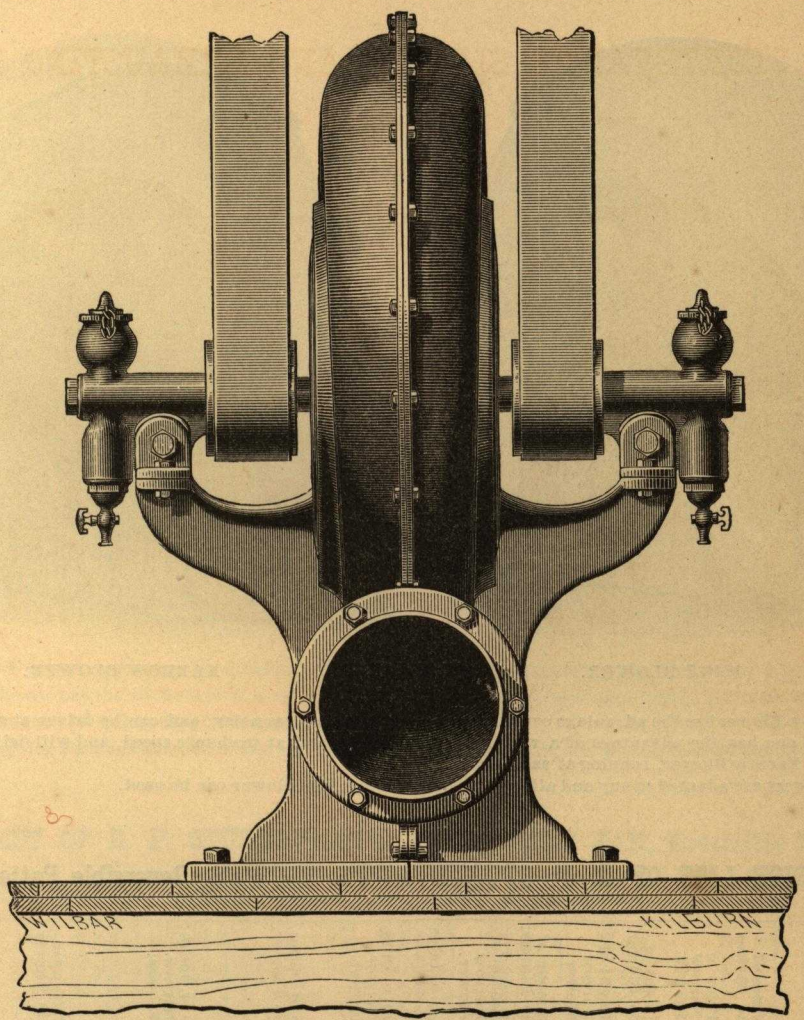
Exhausting Fan.

The blower is peculiarly adapted to all situations where a large volume of air is required. It is, therefore, recommended for use in connection with steam boilers, heating and puddling furnaces, forges, etc., and the ventilation of buildings. This Exhausting Fan is adapted: for removing dust from emery wheels and other polishing wheels used in the manufacture of hardware, silverware, jewelry, etc.; buffing machines used by shoe manufacturers; sand wheels used for smoothing up articles of wood; for taking away smoke and gas generated in smith shops, manufacturing establishments and chemical works; steam and vapor from paper machines and all drying cylinders and drying rooms; sweat from mill-stones; offensive odors from try kettles and dyeing establishments; for ventilating mines and all underground apartments, and for use in refrigerating cars. and refrigerating compartments of steamers for preserving meats, fruits, etc.

Number of Blower.	Price.	Square Feet Grate Surface.	Diameter of Inlet.	Diameter of Outlet.	Diameter of Pulley.	Face of Pulley.	Revolutions per minute.	Cubic Feet of Air per minute.	Horse Power.
00	$20 00	5	5	4	2¾	2	3,000	500	.....
0	26 00	6	5¾	4¾	3	2¼	2,600	600	.....
1	33 00	8	6½	5¾	3½	2½	2,200	764	.60
2	44 00	10	7½	7½	3¾	2¾	1,928	1,019	.79
3	55 00	14	9	9	4¼	3½	1,688	1,427	1.11
4	70 00	20	10½	10½	5	4½	1,410	1,936	1.51
5	90 00	27	12	12	6	5	1,194	2,701	2.10
6	115 00	36	14	14	7	6	1,018	3,669	2.86
7	150 00	48	16	16	9	7½	878	4,847	3.77
8	200 00	62	18	18	10	8½	766	6,115	4.76
9	250 00	80	21	21	12	9½	671	8,154	6.35

B. F. STURTEVANT'S STEEL PRESSURE BLOWER,

FOR CUPOLA FURNACES AND FORGES.



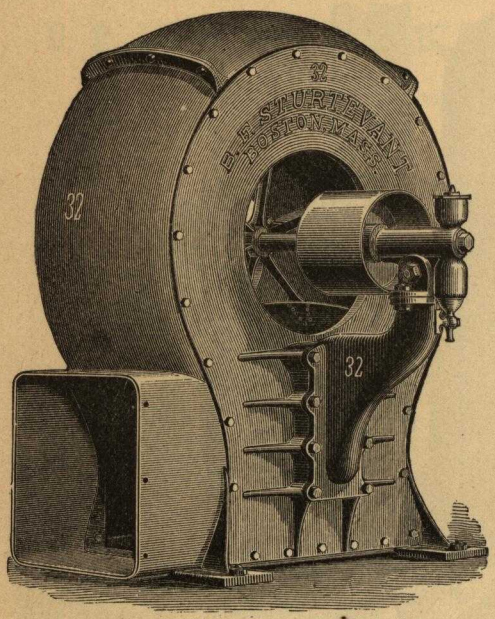
Made expressly for Iron Foundries, and will produce a stronger blast with the same amount of power than any other Blower. This illustration represents the new pattern Pressure Blower of 1876, which contains many new and valuable improvements in the running parts, which have been patented, and which will be found to be of great value to the purchaser. These Blowers are all built much heavier and stronger than the Pressure Blowers have heretofore been made, particularly in the running parts, where they are subject to the most wear; and are especially adapted to Cupola Furnaces and Forges, as formerly. Great pains have been taken to simplify the construction of this Blower, and to strengthen all parts of it. Any machinist of ordinary skill will readily understand how to adjust, keep it in order and repair it. Attention is called to the journal boxes, which contain many new and useful improvements over the old ones, and duplicate sets of these journals will be furnished to purchasers desiring them at a small advance above cost.

REDUCED PRICE LIST.

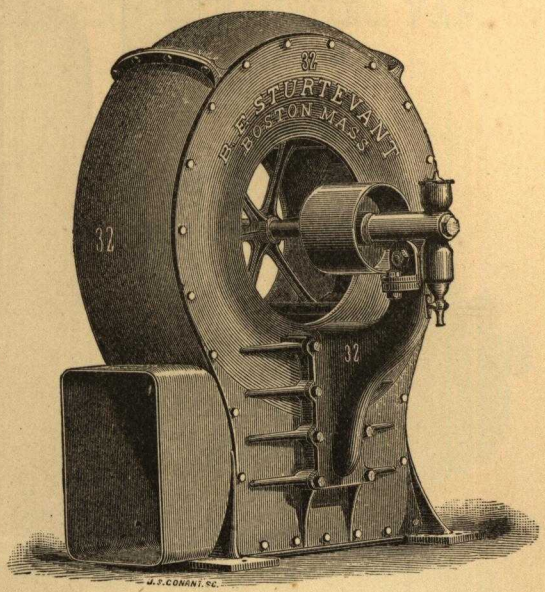
Size of Blower in Inches.	No. of Blower.	Diameter of Pulley in Inches.	Face of Pulley in Inches.	Diameter of Outlet.	Price without Counter Shafts or Pulley.
..	00	2½	1⅞	3⅝	$20 00
..	0	3	2⅛	4¼	26 00
..	1	3¾	2½	4¾	36 00
..	2	3⅞	2¾	5¼	44 00
..	3	4½	3⅛	6⅛	55 00
..	4	4⅞	3½	7½	70 00
40	5	5¾	3¾	8¾	90 00
45	6	6¾	4½	10¼	115 00
53	7	7¾	5½	11⅞	180 00
61	8	9	6⅛	13⅞	225 00
75	9	10	7½	16	325 00
81	10	12	9½	18⅞	450 00

Every Blower warranted.

B. F. STURTEVANT'S BLOWER, Reversible Pattern.



WIDE BLOWER.



NARROW BLOWER.

The Narrow Blower has the advantage over the Wide one, in being less noisy, and can be driven at a higher speed.

The Wide one has the advantage of a very large volume of wind at moderate speed, and will deliver double the volume of the Narrow Blower, running at same speed.

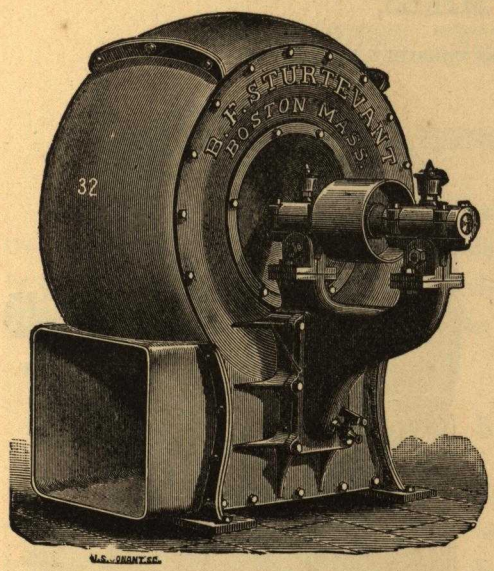
These Blowers are adapted to any and all purposes for which a Fan Blower can be used.

PRICE LIST OF B. F. STURTEVANT'S BLOWER, Reversible Pattern.

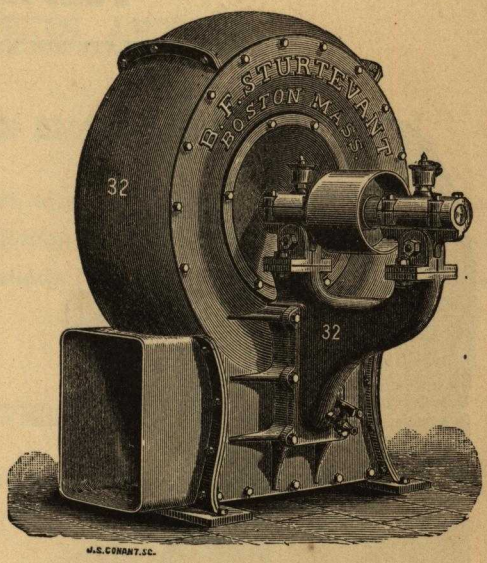
Number of Blower.	Price of Wide Blower.	Price of Narrow Blower.	Height of Wide Blower.	Height of Narrow Blower.	Diameter of Wide Blower.	Diameter of Narrow Blower.	Diam. of Inlet. Wide Blower.	Diam. of Inlet. Narrow Blower.	Size of Outlet. Wide Blower.	Size of Outlet. Narrow Blower.	Pulley for Wide Blower.	Pulley for Narrow Blower.
28	$ 55	$ 44	28½	27½	24½	23	10¾	9½	9½ x 9⅛	9½ x 7	Diam. Face. 5¼ x 4½	Diam. Face. 4½ x 4
29	70	55	32½	31½	27½	26	12⅛	10¼	11½ x 11⅛	10¼ x 8	5¾ x 5	5¼ x 4⅛
30	90	70	37	36	31	29⅛	14	12¼	13 x 13	9 x 13	6½ x 5½	5½ x 5
31	115	90	42	41	35	33	16	14	14 x 14	14 x 10½	7½ x 6½	6½ x 5½
32	150	115	48	46½	41¼	38	18	16	16 x 16	16 x 12	8⅛ x 7⅛	7⅛ x 6½
33	200	150	54	53¼	48	43	21	18	18 x 18	18 x 13½	9½ x 8½	8⅛ x 7⅛
34	250	200	63	61	53	50	24	21	21 x 21	21 x 16	11 x 9	9½ x 8½
35	325	250	72	71	62	60	27	24	24 x 24	24 x 18	12½ x 9⅛	11 x 9
36	400	325	87	81	73	66	31	27	27 x 27	27 x 21	14½ x 10	12⅛ x 9½
37	500	400	98	92	84	75	36	31	31 x 31	31 x 24	16 x 10½	14⅛ x 10
38	650	500	109	103	95	86	40	36	36 x 36	36 x 27	18 x 11	16 x 10½
39	800	650	120	112	106	96	45	40	40 x 40	40 x 31	20 x 12	18 x 11
40	1,000	800	131	124	117	108	52	45	45 x 45	45 x 36	24 x 14	20 x 12

For sizes 20 to 28, see Special List.

B. F. STURTEVANT'S EXHAUSTING FAN, Reversible Pattern.



WIDE EXHAUSTER.



NARROW EXHAUSTER.

The Narrow Exhausting Fan has the advantage over the Wide one in being less noisy, and can be driven at a higher speed. The Wide one has the advantage of a very large volume of wind at moderate speed, and will deliver double the volume of the Narrow Exhausting Fan, running at the same speed.

These Exhausting Fans are adapted to any and all ordinary purposes for which an Exhausting Fan can be used.

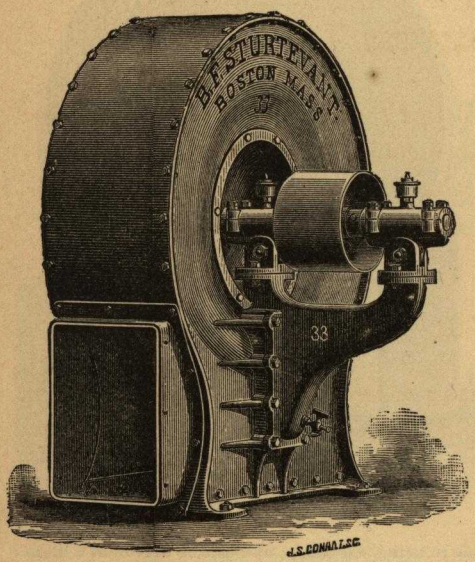
PRICE LIST OF B. F. STURTEVANT'S EXHAUSTING FAN, Reversible Pattern.

Number of Exhauster.	Price of Wide Exhauster.	Price of Narrow Exhauster.	Height of Wide Exhauster.	Height of Narrow Exhauster.	Diameter of Wide Exhauster.	Diameter of Narrow Exhauster.	Diam. of Inlet, Wide Exhauster.	Diam. of Inlet, Narrow Exhauster.	Size of Outlet, Wide Exhauster.	Size of Outlet, Narrow Exhauster.	Pulley for Wide Exhauster.	Pulley for Narrow Exhauster.
											Diam. Face.	Diam. Face.
28	$ 55	$ 44	28½	27½	24½	23	10¾	9½	9½ x 9½	9½ x 7	5¼ x 4½	4½ x 4
29	70	55	32½	31½	27½	26	12½	10¼	11½ x 11½	10¼ x 8	5¾ x 5	5¼ x 4½
30	90	70	37	36	31	29½	14	12¼	13 x 13	9 x 13	6½ x 5½	5½ x 5
31	115	90	42	41	35	33	16	14	14 x 14	14 x 10½	7½ x 6½	6½ x 5½
32	150	115	48	46½	41¼	38	18	16	16 x 16	16 x 12	8 x 7½	7½ x 6½
33	200	150	54	53¼	48	43	21	18	18 x 18	18 x 13½	9½ x 8½	8½ x 7½
34	250	200	63	61	53	50	24	21	21 x 21	21 x 16	11 x 9	9½ x 8½
35	325	250	72	71	62	60	27	24	24 x 24	24 x 18	12½ x 9½	11 x 9
36	400	325	87	81	73	66	31	27	27 x 27	27 x 21	14½ x 10	12¼ x 9½
37	500	400	98	92	84	75	36	31	31 x 31	31 x 24	16 x 10½	14½ x 10
38	650	500	109	103	95	86	40	36	36 x 36	36 x 27	18 x 11	16 x 10½
39	800	650	120	112	106	96	45	40	40 x 40	40 x 31	20 x 12	18 x 11
40	1,000	800	131	124	117	108	52	45	45 x 45	45 x 36	24 x 14	20 x 12¼

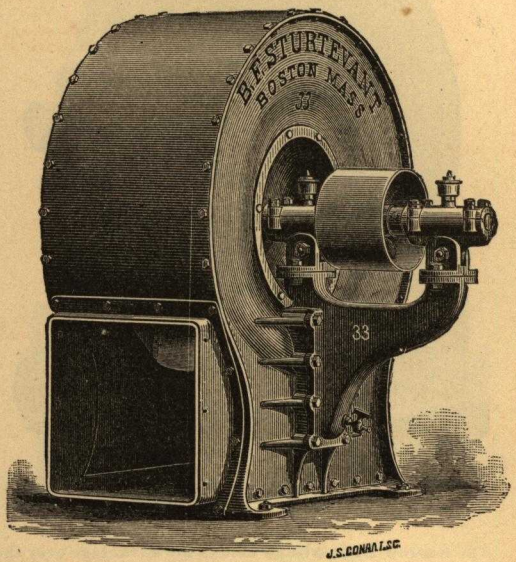
For sizes 20 to 28, write for Special List.

B. F. STURTEVANT'S PATENT EXHAUSTING FAN FOR PLANING MILLS,

WITH BOILER-PLATE RIM AND REVERSIBLE MOUTH-PIECE.



NARROW PATTERN.



WIDE PATTERN.

For removing material from machines which are used in Planing Mills, Sash, Door and Blind Factories, Car Shops, Agricultural Works, Wagon and Carriage Manufactories, Stave, Heading and Barrel Manufactories, Tub and Pail, and all Wooden Ware Works, Furniture, Piano, Organ and Sewing Machine Factories, Saw Mills, Dyewood Works; also, for removing light grains, such as Barley, Oats, etc.

These Exhausters are usually built with both bearings on one side, as shown, unless otherwise ordered by a customer who may prefer a bearing at each side of the Exhauster. The object in having the bearings on one side only is, that the inlet may be entirely unobstructed, so as to allow free ingress for the shavings and any long fibrous material.

I make two widths of these Exhausters, termed narrow and wide pattern. The narrow is recommended where the exhaust and discharge pipes are comparatively long and small, and the material to be removed is of such a nature as to require an extra strong blast, and will be found less noisy running at high speed. The wide is especially designed for large volumes of air where a large number of openings are to be supplied. As a rule the wide Exhauster will be found most desirable where a little noise is not objectionable.

Parties ordering Exhausting Fans should state in all cases whether right or left hand is wanted. In cases where it makes no difference which hand is sent, it should so state in the order. By right hand is meant, pulley on the right hand side as you stand facing the outlet, and by left hand, pulley on left hand side.

PRICE LIST AND PRINCIPAL DIMENSIONS IN INCHES.

Number of Exhauster.	Price of Wide Exhauster.	Price of Narrow Exhaus'r.	Height of both Wide and Narrow Exhauster.	Diameter of both Wide and Narrow Exhauster.	Size of Outlet of Wide Exhauster.	Size of Outlet of Narrow Exhauster.	Diameter of Inlet of Wide Exhauster.	Diameter of Inlet of Narrow Exhauster.	Diam'er of Pulley on Wide Exhauster.	Face of Pulley on Wide Exhauster.	Diame'r of Pulley on Narrow Exhauster.	Face of Pulley on Narrow Exhauster.	Speed of Wide Exhauster for Ordinary Work.	Speed of Narrow Exhauster for Ordinary Work.	Speed of Wide Exhauster for Heavy Work.	Speed of Narrow Exhauster for Heavy Work.
28.....	$55	$44	27⅛	23	9½ x 9½	9½ x 7	10¾	9½	5¼	4½	4½	4	2,316	2,660	3,000	3,348
29.....	70	55	31½	26	11 x 11	11 x 9	12½	10¾	5¾	5	5¼	4½	2,050	2,316	2,660	3,100
30.....	90	70	36	29½	12½ x 12½	12½ x 10	14	12½	6½	5½	5¾	5	1,787	2,050	2,316	2,660
31.....	115	90	41	33	14 x 14	14 x 11½	16	14	7½	6½	6½	5½	1,564	1,787	2,050	2,316
32.....	150	115	46½	38	16½ x 16½	16½ x 13½	18	16	8½	7½	7½	6½	1,360	1,564	1,787	2,050
33.....	200	150	53¼	43	18½ x 18½	18½ x 15	21	18	9½	8½	8½	7½	1,191	1,360	1,564	1,787
34.....	250	200	61	50	21½ x 21½	21½ x 17	24	21	11	9	9½	8½	1,042	1,191	1,360	1,564
35.....	325	250	71	58	24 x 24	24 x 18¼	27½	24	12½	9½	11	9	913	1,042	1,191	1,360

SUGGESTIONS TO CORRESPONDENTS WHEN ORDERING OR MAKING INQUIRIES ABOUT

STEEL PRESSURE BLOWERS.

Be sure to state what they are to be used for, whether Cupola Furnaces, Forges, or other purposes. If for Cupolas, state diameter inside of lining—number and size of Tuyeres—quantity to be melted in given time—kind of fuel used—distance Blower sets from Cupola; if for Forges, how many—kind of work—length of pipes, etc.

FAN BLOWERS.

State the kind and amount of work—if for Furnaces of any kind, give the square feet of grate surface—if for ventilation, give size of rooms (length, width and height) to be ventilated—and length of pipes in all cases.

EXHAUST FANS.

State what they are to be used for, and amount of work they are to do—if for shavings or dust from machines—give the number and size of machines—distance from machines to Exhauster—and also distance the material is to be carried from Exhauster—a diagram showing location of machines, line shaft and direction shaft runs, is a great help.

Be sure to state which hand Exhauster is wanted, Right or Left. By Right Hand is meant Pulley on right hand side as you stand facing the outlet, and by Left Hand Pulley on left hand side. Be sure to state which is preferred.

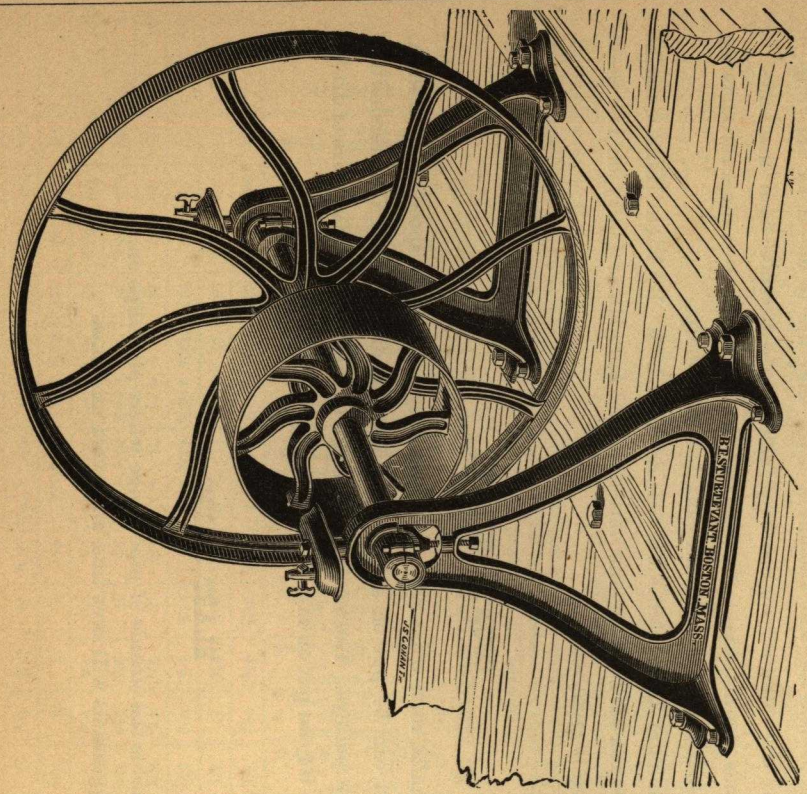
COUNTERSHAFTS.

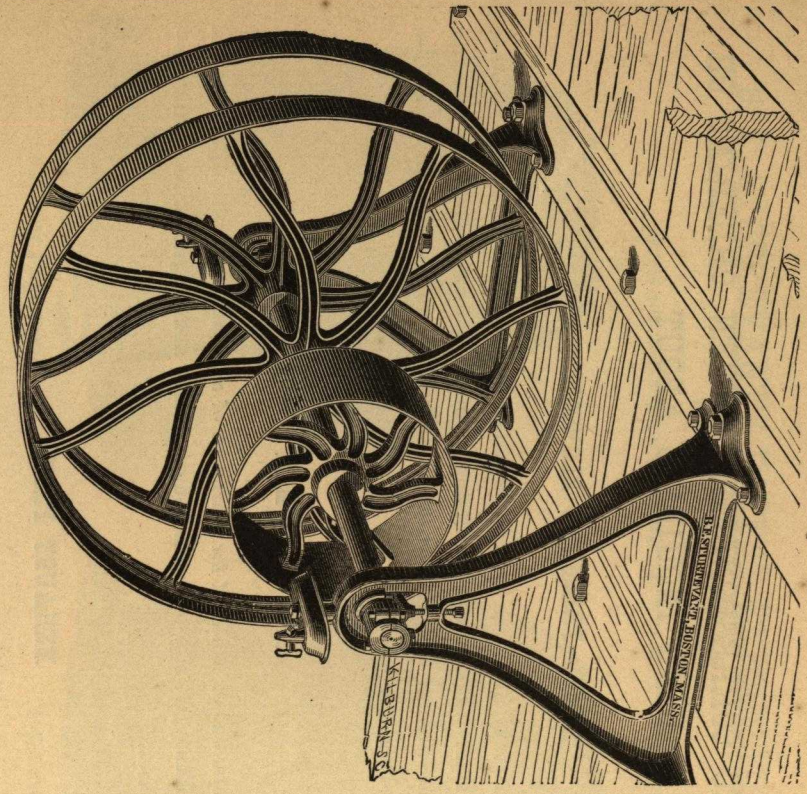
In ordering Countershafts, state what kind of Blower they are for—the speed of main shaft, and the largest pulley that can be put on same. The first column in list of Countershafts is diameter of driving pulley or pulleys. The second column gives the different diameters of driven or main belt pulleys, which we can put on same shaft.

BLAST GATES.

The size given in inches is the outside of pipe flange where pipe slips on.

Attention to these suggestions will save time and avoid mistakes.





Diameter of Driving Pulley.	Diameter of Pulley for Main Belt.	Diameter of Shaft.	Price with Two Driving Pulleys.	Price with One Driving Pulley.
14	5¾, 6	⅞	$10 00	$8 00
16	6, 7	1	12 00	10 00
18	7, 8	1⅛	15 00	12 00
21	7, 8, 9	1¼	20 00	16 00
24	9, 10, 12	1⅜	25 00	22 00
28	10, 12, 14	1⅝	35 00	30 00
32	12, 14, 16	1¾	45 00	40 00
36	12, 14, 16, 18	1 15-16	60 00	50 00
42	14, 16, 18, 20	2 7-16	80 00	68 00
48	18, 20, 22, 24	2 15-16	100 00	85 00
54	18, 20, 22, 24	2 15-16	125 00	100 00

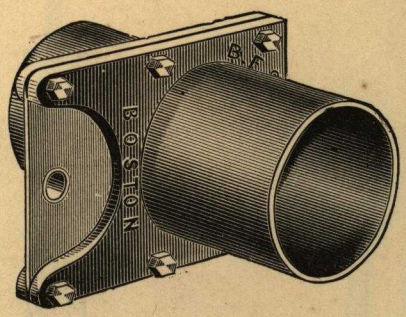
COUNTER-SHAFTS, HANGERS AND PULLEYS.

In ordering Blowers with Counter-Shaft and Pulleys, the purchaser should always be particular to give speed of main line of Shafting and the largest Pulley which can be used thereon, so that Pulleys may be sent to suit the circumstances of the case. It is desirable to get as much speed as possible from main line. Always use as large a Pulley as possible on Counter Shaft for main belt.

All of our Blowers and Exhausters (except Pressure Blowers for Cupola Furnaces and Forges) are built with one Pulley to run with one belt (unless otherwise ordered for two belts). Our Pressure Blowers from No. 4 to 10, inclusive, for Cupola Furnaces and Forges have two Pulleys and run with two belts.

STURTEVANT BLAST GATE,

FOR OPENING AND CLOSING PIPES WHICH SUPPLY BLAST TO FURNACES, FORGES, ETC.



PRICE LIST.

1½ inch, Composition	$1 25
2 inch, Composition	1 50
2½ inch, Composition	1 75
3 inch, Composition	2 00
4 inch, Composition	2 75
5 inch, Iron	2 75
6 inch, Iron	3 25
8 inch, Iron	4 50
10 inch, Iron	6 00
12 inch, Iron	8 00
14 inch, Iron	10 00
15 inch, Iron	12 00
16 inch, Iron	15 00
18 inch, Iron	18 00
20 inch, Iron	20 00
24 inch, Iron	25 00

These measurements apply to the outside of the Collars of the Blast Gate.

HAND BOILER FEED PUMP, ON PLANK OR ON BASE.

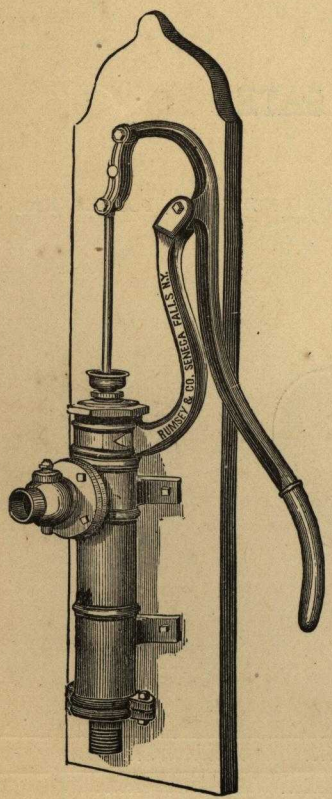


Fig. 161.

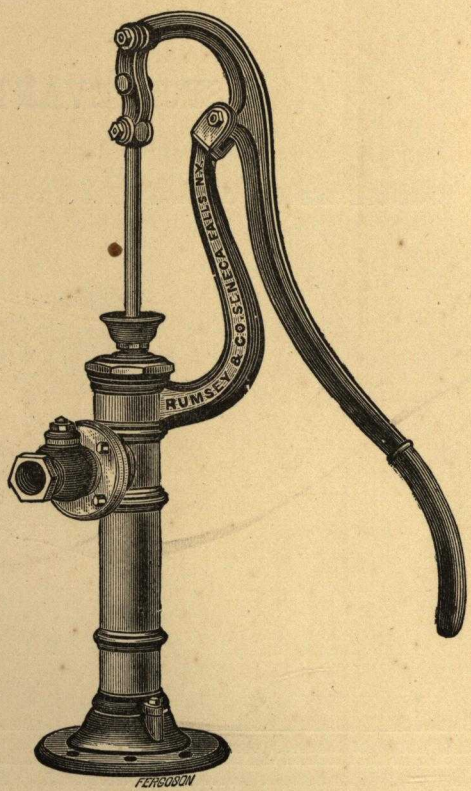


Fig. 295.

The above Figures show a very serviceable Pump for feeding small boilers by hand power, well adapted for use in Mint Distilleries, Cheese Factories, etc. It is also of ample capacity for feeding larger boilers, when used for heating buildings by steam, especially if a steam trap is employed for saving the condensed steam and returning it to the boiler. They are constructed on true scientific principles, with economy of cost, and are fitted with metallic valves for pumping hot as well as cold water. The rod and plunger are of brass. We make this Pump either with brackets for bolting to plank or partition, or on Base, for fastening to platform of well or reservoir.

SIZES, CAPACITY AND PRICES.

	Cylinder.	Capacity per Stroke.	Iron.	Brass Cylinder.
Number 0	2 inch.	0.06 gallon for 1 in. pipe.	$12 00	$18 00
Number 00	2¼ inch.	0 08 gallon for 1¼ in. pipe.	14 00	22 00

STEAM BOILER FORCE PUMP.

FOR POWER.

Fig. 163 represents our modification of the well-known form of "Frictionless Plunger Pump," for supplying steam boilers with water under pressure, by power. We make seven sizes, constructed in a strong and substantial manner, and fit them for attaching wrought iron pipe, as follows·

SIZES, CAPACITY AND PRICES—Fig. 163.

No.	Diam. of Piston.	Length of Stroke.	Capacity per Stroke.	No of Strokes.	Size of Pipes.	Price.
	Inch.	Inch.	Gallon.	Per Min.	Inch.	
22	1¼	6	0.04	50	¾	$10 00
22	1½	6	0.05	50	1	15 00
22	2	6	0.08	45	1	22 00
22	2½	6	0.13	40	1¼	30 00
22	3	6	0.20	40	1½	40 00
22	4	10	0.50	40	2	60 00
22	5	10	0.84	40	2½	90 00

All sizes of Fig. 163 are made with Cast Brass Plungers.

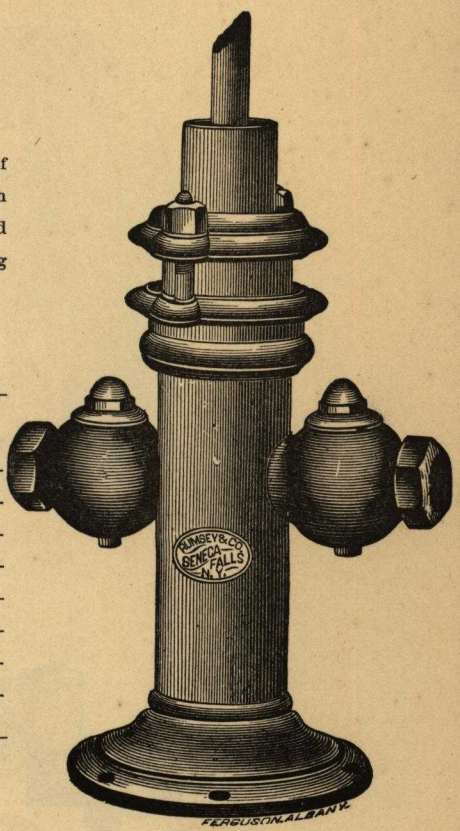


Fig. 163.

PRESSURE PUMP.

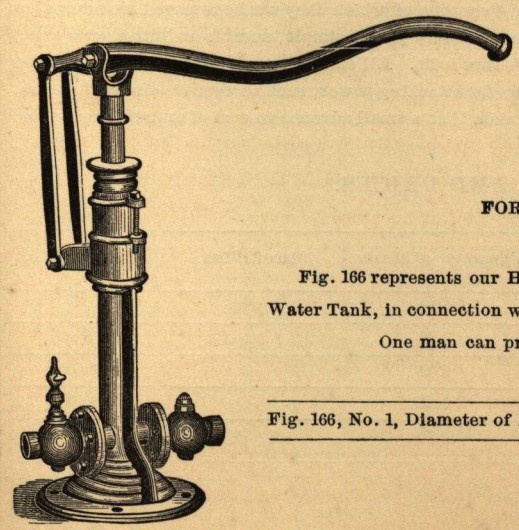


Fig. 166.

FOR TESTING BOILERS, PIPES, ETC.

Fig. 166 represents our Hydraulic Pressure Pump, generally mounted on a Portable Water Tank, in connection with a Hydraulic Gauge.

One man can produce a pressure of 1,000 pounds per square inch.

Fig. 166, No. 1, Diameter of Piston 1¼ inch, price.....	$25 00

STEAM BOILER FEED PUMP, FOR POWER,

WITH AIR-CHAMBER.

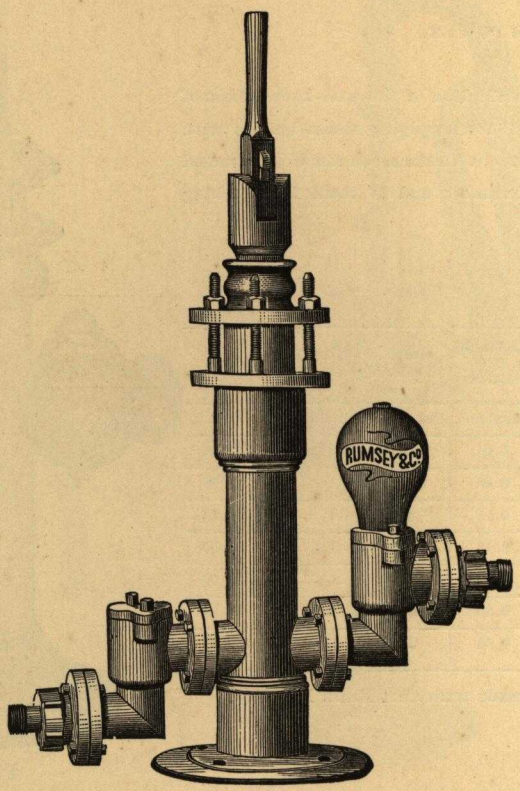


Fig. 162.

Fig. 162 accurately represents our "Champion" Power Boiler Feeding Pump, having an air-chamber on the discharge valve. This Pump is the strongest and best article of the kind made. The valves and seats are of Bronze, and held in place by an ingenious device of our own invention, by means of which they can be removed for renewal or repair at a trifling cost, and without the aid of a skilled mechanic. Every part is simple, durable and fitted with exact gauges, so that in case of need, duplicates can be had which are sure to fit. All sizes are made with brass plungers and brass nuts on studs of stuffing gland. We furnish all appliances for attaching power, such as counter-shafts, hangers, post boxes, pulleys or gears, crank plate, wrist-pin and "stub ends," at a small advance on cost of material and labor.

SIZES, CAPACITY AND PRICES.

No.	Piston.	Length of Stroke.	Capacity of Stroke.	Size of Pipe.	Price.
	Inch.	Inch.	Gallon.	Inch.	
1	1¼	12	0.09	1	$35 00
2	2	12	0.14	1	40 00
3	2½	12	0.25	1¼	50 00
4	3	12	0 36	1½	60 00

STEAM BOILER FEED PUMP, ON COLUMN.

FOR TIGHT OR LOOSE PULLEYS—FOR HAND POWER.

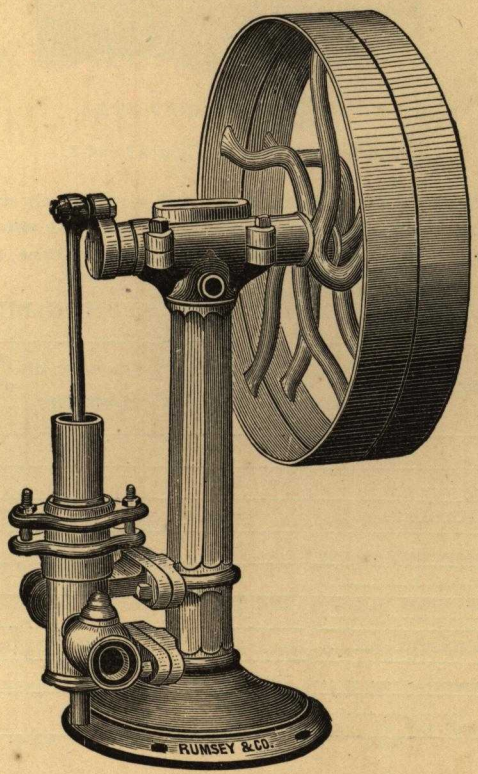


Fig. 165.

Fig. 165 shows our Steam Boiler Feed Pump, similar to that described under Fig. 163, mounted on a broad and substantial base, with strong column supporting the crank-shaft and pulleys; designed for supplying steam boilers with hot or cold water. The pulleys are turned instead of ground, and the utmost care used in every point of principle and construction. This Pump will feed boilers under any steam pressure. It does not require a countershaft or other rigging for the appliance of power, but can be placed under the main line of shafting, or connected with the countershaft of the engine direct. The pulleys on the Pumps of 3-inch stroke are 18 inches diameter and 3 inches face, and for 6-inch stroke are 22 inches diameter and 4 inches face.

SIZES, CAPACITY AND PRICES.

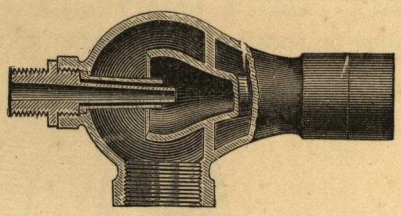
	Cylinder.	Stroke.	Capacity per Stroke.	Revolutions.	Size of Pipe.	Price, Fig. 165.	Price, Fig. 164.
No. 21.....	2 inch.	3 inch.	0 04 gallon.	50 per minute.	1 inch.	$34 00	$30 00
No. 21.....	2½ inch.	3 inch.	0 06 gallon.	50 per minute.	1¼ inch.	40 00	38 00
No. 21.....	3 inch.	3 inch.	0.10 gallon.	45 per minute.	1½ inch.	50 00	48 00
No. 21.....	2 inch.	6 inch.	0.08 gallon.	40 per minute.	1 inch.	65 00	60 00
No. 21.....	2½ inch.	6 inch.	0.13 gallon.	40 per minute.	1¼ inch.	75 00	70 00
No. 21.....	3 inch.	6 inch.	0.20 gallon.	40 per minute.	1½ inch.	85 00	80 00

Fig. 164 (not shown) has a Fly Wheel, with handle attached, for hand power, in place of the tight and loose pulleys. The form of this Pump is more particularly calculated for hand use, still the face of the fly-wheel will accommodate a 2½ or 4-inch belt, if desirable.

All sizes of Figs. 164 nnd 165 have Cast Brass Plungers.

COLL'S PATENT EJECTOR.

NON-FREEZING.



This Pump is used for Figures 2 and 3.

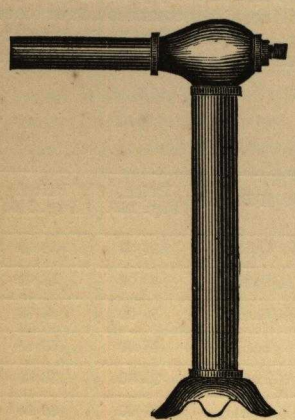
Is one of the most effective Steam Jet Pumps in the world, and is extensively used by Steamboats, Locomotives, Mills, etc. It is made of iron, and is extra heavy, and, therefore, is in demand where hard usage is expected. This Pump is recommended for elevations not exceeding 35 feet. For greater elevations, see description of Defiance Pump.

CAPACITY AND PRICES OF SYPHON PUMPS.

Gas Pipe Size, inches	Delivery per hour in gallons, at 40 lbs. steam pressure.	Diameter of Steam Pipe.	Diameter of Delivery Pipe.	Prices.	
				Iron.	Strainers for same.
1 inch	890	¾	1	$10 00	1 00
1¼ inch	1,250	1	1¼	15 00	1 00
1½ inch	1,960	1	1½	20 00	1 50
2 inch	3,200	1¼	2	24 00	1 50
2½ inch	5,125	1½	2½	28 00	2 00
3 inch	8,050	1½	3	32 00	2 50
4 inch	9,800	1½	4	52 00	4 00
5 inch	13,000	2	4½	72 00	5 00
6 inch	16,000	2	6	96 00	6 00

COLL'S PATENT EJECTOR OR SYPHON PUMP.

FITTED WITH GALVANIZED PIPE AND STRAINERS.



We construct these celebrated Pumps, as shown in the cut, for use on Tow Boats in relieving Coal Barges and Coal Boats of the leakage from accidents which may occur in conveying them to their destination. These Pumps are also much used by the Grain Tow Boats for the purpose above mentioned. These Pumps are fitted with light iron pipes, which are carefully galvanized to prevent rusting, making them at once light to handle and at the same time durable. Reference need only to be made to the hundreds of Ohio and Mississippi River Tow Boats having them in use to prove their utility.

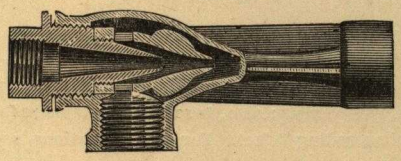
PRICES FOR COAL BOAT AND BARGE LENGTHS.

Size	2½	3	4	5	6	8	10
Price	$40	50	80	115	150	200	300

COLL'S PATENT DEFIANCE PUMP.

FOR LOCOMOTIVES. ALL TANKS AND COSTLY PUMPS ARE DISPENSED WITH.

ABSOLUTELY NON-FREEZING.



This Pump is suitable for Figures 2 and 3.

This Ejector is by all odds the very best of its class as a means of elevating water or other liquids with great economy of steam. It is constructed of the best composition, and recommended for Mines, Locomotives or Mills. These Pumps are carefully tested and stamped with elevation and steam pressure, at which they are guaranteed to be effectual. The Defiance Pump is warranted to elevate water 75 feet with 50 pounds of steam pressure. The Defiance Pump is double-acting, therefore it requires but half the steam of any Jet Pump in existence. It is not a Boiler Feeder.

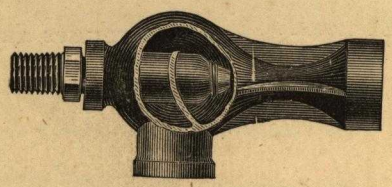
CAPACITY AND PRICES FOR DEFIANCE PUMPS.

Gas Pipe Size, inches.	Delivery per hour in gallons, at 50 lbs. steam pressure.	Diameter of Steam Pipe.	Diameter of Delivery Pipe.	Prices.	
				Brass.	Strainers for same.
1 inch	350	½	1	$ 16 00	
1¼ inch	850	¾	1¼	25 00	
1½ inch	1,400	1	1½	35 00	$1 50
2 inch	2,300	1	2	50 00	1 50
2½ inch	2,800	1¼	2½	65 00	2 00
3 inch	3,500	1¼	3	85 00	2 50
4 inch	6,000	1½	4	100 00	4 00
5 inch	13,000	2	5	150 00	5 00
6 inch	16,000	2½	6	200 00	6 00

A higher pressure of steam will give a corresponding increased result.

SHERIFF'S PATENT PUMP.

NON-FREEZING.



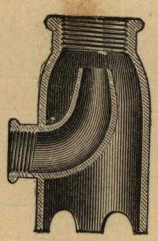
This Pump is suitable for Figures 2 and 3.

Is a most desirable apparatus for elevating water or liquids, is made of best composition, and is preferred on this account in localities where brackish water exists; also, is selected by tanners for their use. They are guaranteed to give good satisfaction in elevations not exceeding 35 feet. For great elevations, see description of Defiance Pump.

CAPACITY AND PRICES OF SYPHON PUMPS.

Gas Pipe Size, inches.	Delivery per hour in gallons, at 40 lbs. steam pressure.	Diameter of Steam Pipe.	Diameter of Delivery Pipe.	Prices.	
				Brass.	Strainers for same.
1 inch	800	¾	1	$10 00	$1 00
1¼ inch	1,050	1	1¼	15 00	1 00
1½ inch	1,600	1	1½	20 00	1 50
2 inch	3,000	1¼	2	24 00	1 50
2½ inch	4,500	1½	2½	28 00	2 00
3 inch	7,000	1½	3	32 00	2 50
4 inch	8,800	1½	4	52 00	4 00
5 inch	10,000	2	4½	72 00	5 00
6 inch	12,000	2	6	96 00	6 00

McKNIGHT STEAM SYPHON.



This Pump is extensively use for freeing the hulls of steamers of the bilge water. It works with a low pressure of steam, and is in demand because of its simplicity and cheapness. Recommended for elevations not exceeding 10 feet.

PRICES.

Size	1	1¼	1½	2	2½	3	4	5	6
Price	$3 00	4 00	4 75	6 00	7 00	8 00	10 00	15 00	20 00

THE "COLL" PATENT SYPHON PUMP.

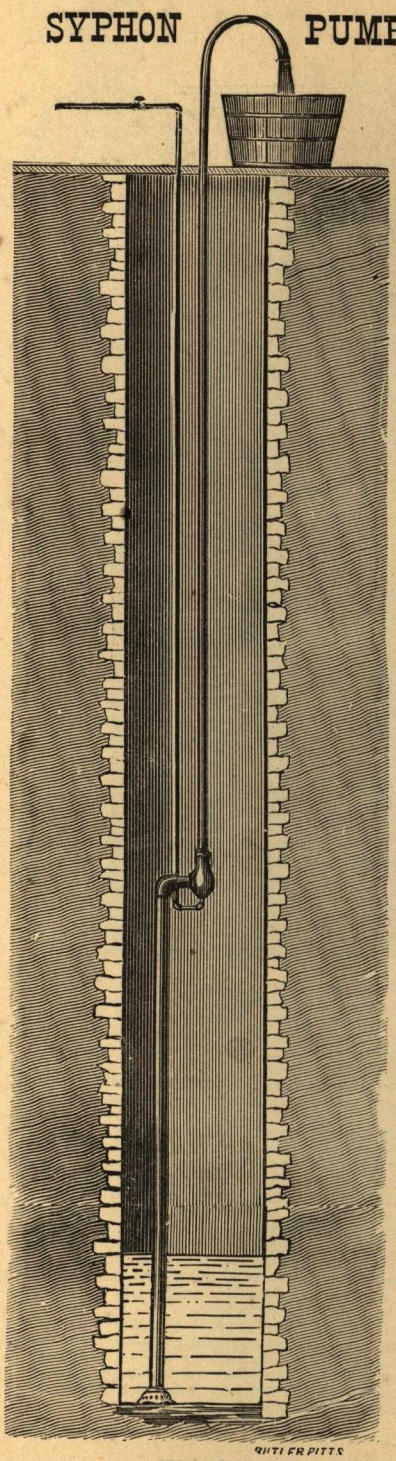


Fig. 2.

Adapted for pumping out overflowed cellars, stationary wash tubs, etc.

The cut here shown illustrates the Syphon Pump operating in a deep well. The coldest weather has no effect on the working of these Pumps; when steam is shut off they drain completely. A strainer must in all cases be used, and no foot valve whatever, as it will obstruct the working of the Pump.

WATER STATION FOR LOCOMOTIVES.

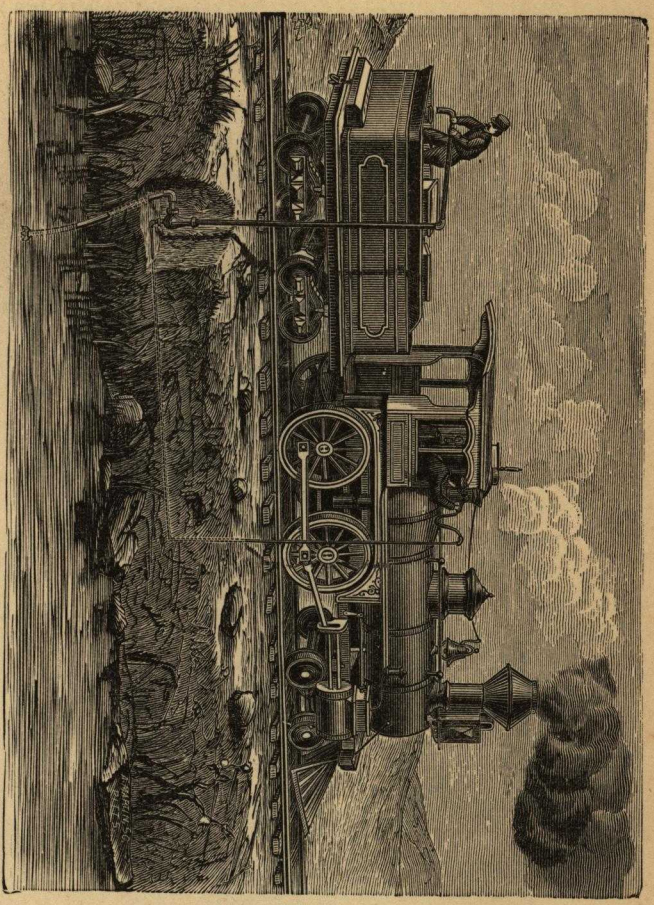


Fig. 3.

We present a cheap and durable method of supplying engines with water from streams, wells or ponds. The whole apparatus consists of one of our Patent Improved Steam Syphon Pumps, connected by gas pipes, for suction and delivery water to the tender.

The delivery pipe, being arranged with a swing joint, is easily and quickly moved to one side after using. The steam pipe is also gas pipe, with the exception of a short section of steam hose, having a coupling at one end to connect with the valve on the steam dome of the engine. By disconnecting this coupling the whole apparatus is ready for the next engine.

RAPIDITY OF FILLING.

A three-inch Pump will fill a 1,200 gallon tender in less than four minutes.

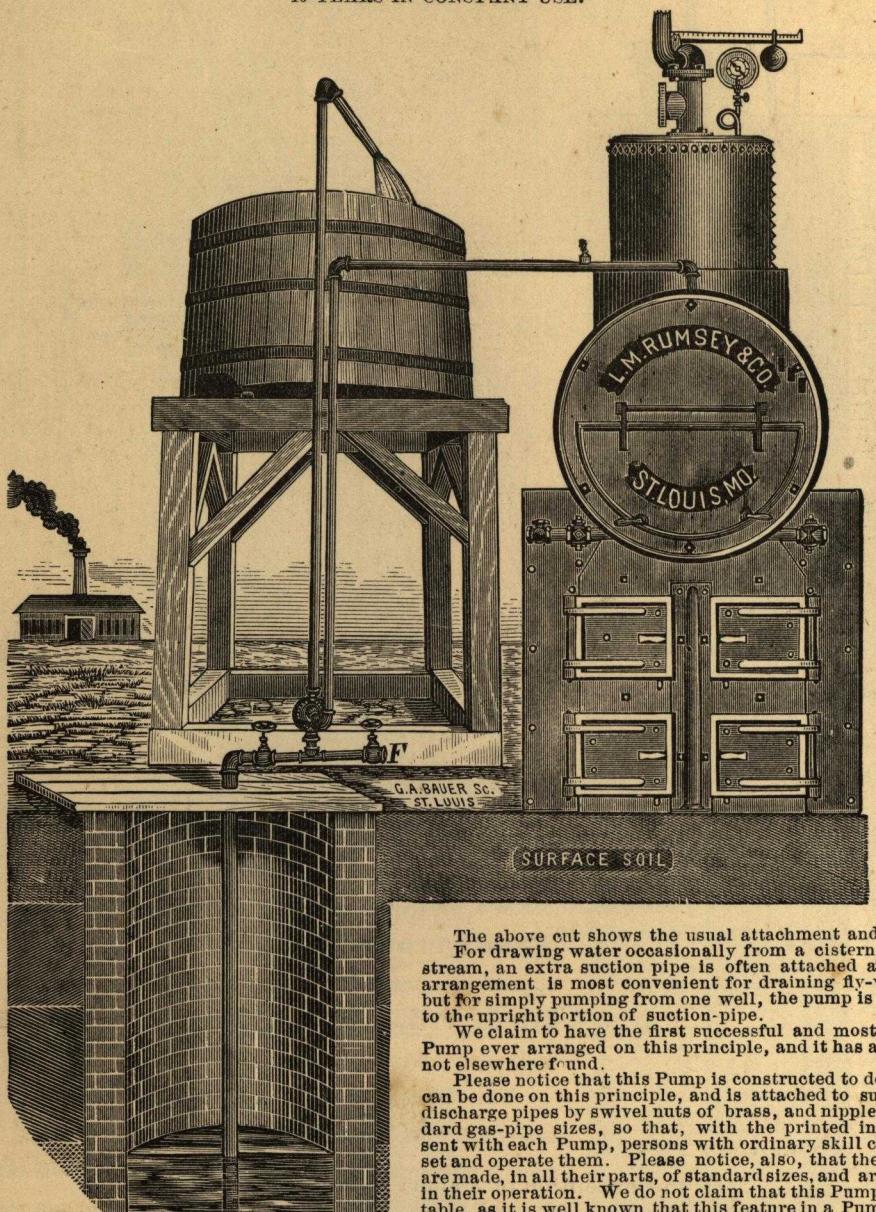
NO TANKS REQUIRED.

Our arrangement saves the first cost and subsequent expense of maintaining large reservoirs, boilers and steam pumps, with their necessary houses, sheds, etc.

BLAKESLEE'S STEAM JET PUMP.

(Patented June 15, 1869.)

10 YEARS IN CONSTANT USE.



The above cut shows the usual attachment and position.

For drawing water occasionally from a cistern, pond or stream, an extra suction pipe is often attached at F. This arrangement is most convenient for draining fly-wheel pit; but for simply pumping from one well, the pump is connected to the upright portion of suction-pipe.

We claim to have the first successful and most powerful Pump ever arranged on this principle, and it has advantages not elsewhere found.

Please notice that this Pump is constructed to do all that can be done on this principle, and is attached to suction and discharge pipes by swivel nuts of brass, and nipples of standard gas-pipe sizes, so that, with the printed instructions sent with each Pump, persons with ordinary skill can readily set and operate them. Please notice, also, that these Pumps are made, in all their parts, of standard sizes, and are uniform in their operation. We do not claim that this Pump is adjustable, as it is well known that this feature in a Pump is of no value. These Pumps are made exclusively to pump water with a certainty, and our mode of proceeding is to shut off steam when sufficient water is obtained.

We make special Pumps for special situations, and can make them to have 18 to 20 feet suction. This Pump, being operated by steam direct from the boiler, can be placed in a well, cistern, near a river, or other water supply, a long distance from the boiler. The standard size will make 14 feet suction, and raise water from 15 to 60 feet in height. The pressure of steam required is about 1 pound per square inch for each foot the water is to be raised.

TO PURCHASERS OF PUMPS.

1st—Size of Pump is determined by the internal diameter of suction-pipe.

2d—In no case should a smaller pipe be used than indicated in table on page 493, and where the pump is placed a long distance from the boiler, the steam-pipe should be one or two sizes larger, and protected by felting, or similar covering. This is also advisable where pumps are placed far under water, in wells, or are liable to be submerged by high water in rivers.

3d—With every pump we send a special guarantee.

4th—In ordering pumps, give distance of water from tank; from the boiler to where the pump is desired to be placed; height to which the water is to be raised, and pressure of steam used.

Write plainly your address and express office.

Exact Duplicates of any parts of these Pumps can be obtained of us. In ordering them, do not neglect to state the size of the Pump.

(Secured by Letters Patent June 15, 1869.)

BLAKESLEE'S STEAM JET PUMPS,

DESIGNED FOR SUPPLYING WATER TANKS AT MILLS, FACTORIES, AND FOR PUMPING WATER, OR OTHER LIQUIDS, AT MINES, STONE QUARRIES, TANNERIES, OIL WORKS, ETC., ETC.

In offering this Pump to the trade and operators of steam power, while so many have hitherto claimed absolute perfection, we would ask any one interested to look at the reasons why this Pump is claimed to be the best yet offered for all the common uses to which Pumps are applied when operated by steam.

It is well known that in most locations it is necessary to raise water only to moderate heights for the use of the immense number of mills, mines, quarries, factories, etc., scattered over the wide extent of our country. It is also well known that most Pumps heretofore used, though expensive in their construction, have been found difficult or uncertain in their operation, and considering the care and skill required to make them supply a given amount of water, it has been found that they are not in all respects satisfactory, as there is always a degree of uncertainty in their work, even with pure water, while for pumping impure water they are in a short time either very troublesome or entirely worthless. Certainty and durability are qualities desirable in all machinery, or its auxiliaries, and especially is this true of the Pump, for if a derangement or stoppage takes place here, if not properly remedied, the whole operation ceases, and, in its stead, the perplexed proprietor must incur expenses, more or less, in making repairs.

To obviate, as much as possible, the perplexities and annoyance of pumping water this Pump has been placed in the market, with how much success can be known by the fact that a great number have been sold, with a present demand better than ever before; and since their introduction (ten years) they have been proven to be reliable, and are more and more satisfactory the longer they are used. This brings us to the points to which we invite the attention of owners of mills, factories, steamboats, etc., or any other parties desiring to pump water by the direct action of steam.

1. Simplicity. 2. Is independent of engine. 3. Will pump sandy or impure water. 4. Have no valves, and no wear. 5. Not subject to freezing. 6. Economy and reliability.

DIRECTIONS FOR PUTTING UP STEAM JET PUMPS.

Place the pump so it will have the least suction circumstances and convenience will admit of, but never over fourteen feet perpendicular.

Attach the steam-pipe to boiler, and extend it to the point where the pump is to set.

Put a stop-cock in the steam-pipe, at a convenient point, to start and stop the pump.

Screw the pump on to the steam-pipe, and then attach the suction-pipe and discharge-pipe, as shown in the cut, with the swivel nuts.

The pump will work in any position, but the pipes should be as straight as possible. The discharge pipe must not have an elbow in it near the pump, if the suction-pipe be long.

Be sure that the suction-pipe, and all joints about the pump, are perfectly tight, and that the gum-gaskets are in their proper places—one under the suction-pipe swivel, and one on the brass combining-pipe.

As stop-valves are always liable to get worn, and leak, it will always be best to put a drip-hole and plug in the pipe, just beyond the stop-valve, toward the pump, which should be taken out in cold weather after using the pump.

The suction-pipe should have a strainer on the end, with holes a little smaller than the combining-pipe, but give plenty of water opening to the strainer, so as not to cut off the supply of water.

The discharge-pipe must be put up so that the water will all run out when steam is shut off.

DIRECTIONS FOR OPERATING.

Turn on the steam slowly until the suction is formed, which will be indicated by a peculiar singing noise in the pump; then turn on steam enough to drive the water to point of discharge.

If the pump fails to start, and the suction-pipe gets hot, it is caused by one of three things: 1. Leaks in the suction-pipe. 2. Obstructions in the suction-pipe, or in the pump. 3. Too high suction.

25 lbs. of steam ought always to form the suction, and higher steam must be carried according to the height of discharge, at about the rate of 1 lb. to each foot.

The brass set-screw is to draw off the condensed steam in cold weather.

PRICE OF PUMPS, WITH BRASS FITTINGS.

Size of Pump.	Suction Pipe	Discharge Pipe.	Steam Pipe.	Steam Opening.	Capacity Per Minute.	Price.
¾ inch	¾ inch.	½ inch.	⅜ inch.	3-16	8 gallons.	$ 8 00
1 inch	1 inch.	¾ inch.	½ inch.	4-16	15 gallons.	10 00
1¼ inch	1¼ inch.	1 inch.	½ inch.	5-16	20 gallons.	12 00
1½ inch	1½ inch.	1¼ inch.	¾ inch.	6-16	30 gallons.	14 00
2 inch	2 inch.	1½ inch.	¾ inch.	7-16	40 gallons.	16 00
2½ inch	2½ inch.	2 inch.	1 inch.	8-16	50 gallons.	20 00
3 inch	3 inch.	2½ inch.	1 inch.	9-16	60 gallons.	24 00

Brass Pumps will be furnished at an additional cost of from 15 to 20 per cent.

BILGE PUMP.

SPECIALLY ADAPTED TO THE USE OF VESSELS OF ALL KINDS, TANNERIES, AND SIMILAR PURPOSES.

These Pumps are adapted to raising a large amount of water with but little steam. They are not designed for raising water to great heights; but make from 18 to 22 feet suction. They are the best Bilge Pump known, and we invite all Steamboatmen to give them a trial. Every Pump warranted. No possibility of freezing.

PRICES.

1½ inch Pump	$15 00	3 inch Pump	$25 00
2 inch Pump	20 00	4 inch Pump	30 00

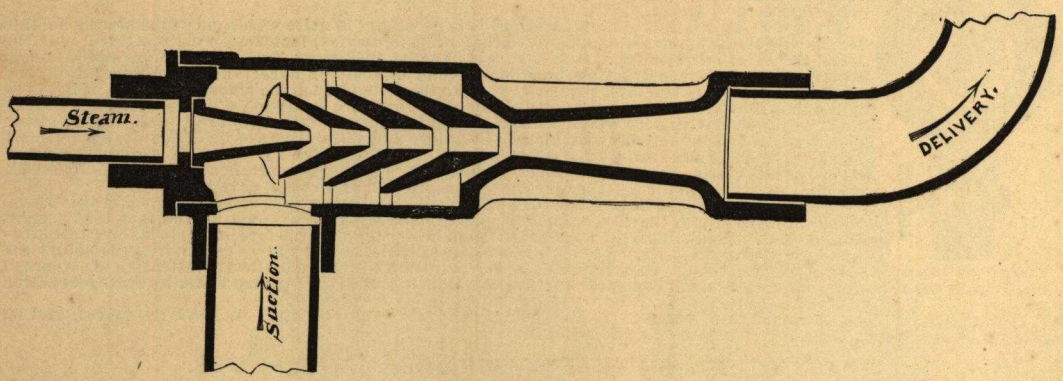
Largest opening is suction; smallest is steam, and medium sized opening is discharge.

DIRECTIONS.

Connect steam-pipe to boiler, with globe-valve in a convenient place, run it to a suitable place for Pump; screw Pump to steam pipe by a common thimble; afterwards attach suction-pipe to the largest opening, and discharge-pipe to the medium sized opening, and the Pump is ready for use.

FRIEDMANN'S PATENT EJECTORS,

FOR RAISING WATER AND CONVEYING LIQUIDS.



Sectional View of Ejectors.

These Ejectors are the most effective agents, within recognized limits, that can be employed for Raising Water and Conveying Liquids—in many cases the only ones that can properly do the work.

They are a marvel of simplicity in construction.

They require only a small quantity of Steam to keep them going, and in this respect have a great advantage over Syphons and other contrivances, which use a great deal, and in many cases have dispensed with altogether on that account.

RAISING WATER.

They will raise water from Mines, Quarries, Wells, Cisterns, Dams, Rivers and Holds of Vessels.

As a Bilge Pump for the latter purpose they have no equal. These Ejectors are also especially adapted for use at Railroad Water Stations, and to raise water for purposes of irrigation.

For temporary use in keeping the water clear in Sinking Wells or Foundations, their readiness of application and cheapness will recommend them at once. Unlike pumps, they raise muddy, sandy or gritty water as readily as clean. By placing the Ejector as near as possible to the water, it can be raised, according to steam pressure, several hundred feet. In case the water has not to be raised above the surface of the ground, we make Ejectors, Class L, which will lift the water from twenty to twenty-five feet.

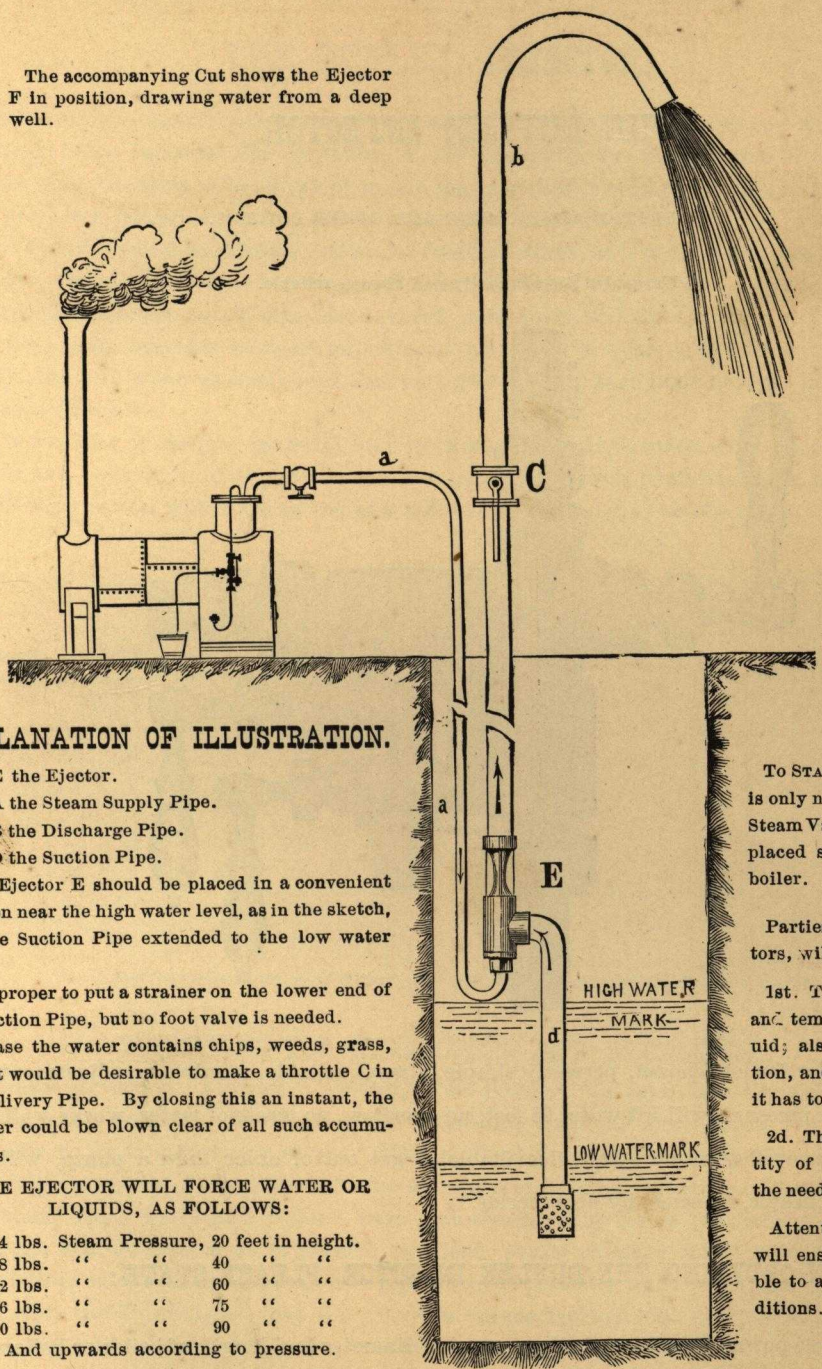
CONVEYING LIQUIDS.

In this varied field of operations the Ejector, as a means of Raising Liquids from one floor to another, or conveying them from vessel to vessel, is a method that stands unrivaled in directness and effectiveness; and in Breweries, Chemical Works, and other places, where the liquid is to be kept in a heated condition, its use becomes an absolute necessity. It can also be employed to great advantage instead of pumps in Distilleries, Sugar Refineries, Paper Mills, Tanneries, Print, Dye and other works where liquids, in various forms of consistence, are required to be raised or conveyed from place to place. It will take the liquid at a temperature of 175 degrees.

The pressure of steam needed to force liquids to different heights will be found in the Table of Capacities, hereafter given.

FRIEDMANN'S PATENT EJECTORS.

The accompanying Cut shows the Ejector F in position, drawing water from a deep well.



EXPLANATION OF ILLUSTRATION.

E the Ejector.

A the Steam Supply Pipe.

B the Discharge Pipe.

D the Suction Pipe.

The Ejector E should be placed in a convenient position near the high water level, as in the sketch, and the Suction Pipe extended to the low water mark.

It is proper to put a strainer on the lower end of the Suction Pipe, but no foot valve is needed.

In case the water contains chips, weeds, grass, etc., it would be desirable to make a throttle C in the Delivery Pipe. By closing this an instant, the strainer could be blown clear of all such accumulations.

THE EJECTOR WILL FORCE WATER OR LIQUIDS, AS FOLLOWS:

At 14 lbs. Steam Pressure, 20 feet in height.
At 28 lbs. " " 40 " "
At 42 lbs. " " 60 " "
At 56 lbs. " " 75 " "
At 70 lbs. " " 90 " "
And upwards according to pressure.

To START THE EJECTOR.—It is only necessary to open the Steam Valve, which is usually placed somewhere near the boiler.

Parties in ordering Ejectors, will please give:

1st. The nature, quantity and temperature of the liquid; also, the depth of suction, and the height to which it has to be raised.

2d. The pressure and quantity of steam available for the needed purposes.

Attention to these details will ensure an Ejector suitable to all these various conditions.

CAPACITY AND PRICE LIST OF EJECTORS.

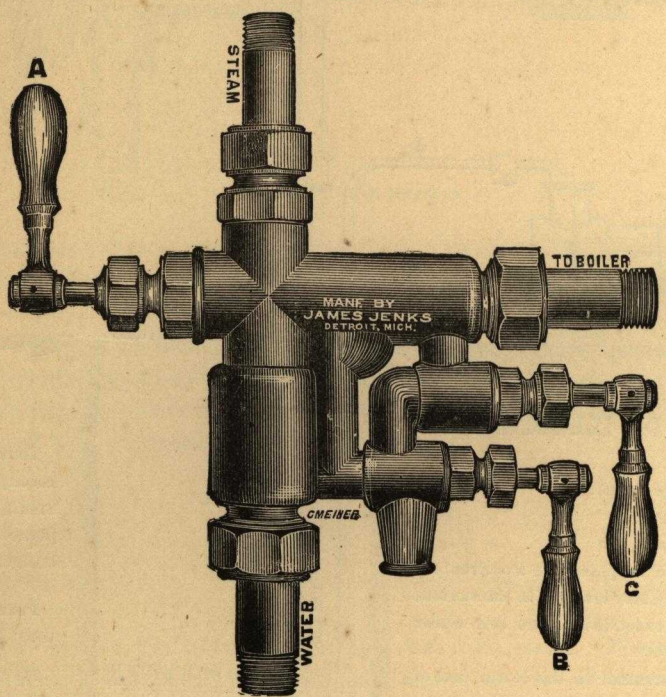
Number	000	00	0	1	2	3	4	5	6
Delivery per hour in Gallons at 45 lbs. Steam Pressure	250	500	900	1,200	2,000	3,000	5,000	8,000	10.000
Diameter of Steam Pipe	⅜	½	¾	¾	1¼	1¼	1½	2	2½
Diameter of Delivery Pipe	½	¾	1 in	1¼	1½	2	2½	3	4
Price	$10 00	16 00	25 00	40 00	70 00	95 00	130 00	150 00	180 00

At 80 lbs. Steam Pressure the Ejector will throw 50 per cent. more water.

THE DUPLEX INJECTOR,

FOR STATIONARY, MARINE AND OTHER BOILERS.

Unequaled for simplicity and always reliable.



The best boiler feeder known, perfectly simple, always reliable, requires no adjustment, will take water under pressure, will lift water 25 feet, no overflow, no waste of water, works well with high steam, works well with low steam, less liable to get out of order than a pump, will feed water through a heater, for economy no superior.

IN ORDERING THE DUPLEX INJECTOR, PLEASE STATE:

1st. The horse power of boiler or boilers; or give diameter and length of boiler or boilers and style, viz: Tubular Two-flue, Portable or Marine.

2d. Give the steam pressure carried.

3d. Whether water is taken under pressure or not.

4th. If water is to be lifted, the lift, or distance from Injector to water supply, both vertically and horizontally.

THE DUPLEX INJECTOR.

This name was decided upon as best expressing its operation and from the fact that it is a combination of two Injectors, the operation of one depending on the operation of the other, and so adjusted that one governs the other in such a manner that it requires no special adjustment for varying pressures, hot or cold water, water under pressure or suction.

It is one of the best appliances known for feeding boilers, as it always delivers the water hot to the boiler, and all the steam used in operating it is returned to the boiler, there being no loss of heat except by radiation, and if pipes are covered, practically no loss whatever.

There are no movable parts for adjustment, no valves to wear, so as to impair the working of the Injector, and it can be safely said that no Injector made is so little liable to get out of order as the Duplex Injector.

It is superior in design, material and workmanship. It is made with the best improved machinery and tools, so as to duplicate each size perfectly in each particular part, and furnished at the following prices, which are as low as a reliable boiler feeder as can be made.

PRICES OF DUPLEX INJECTORS FOR STATIONARY AND MARINE BOILERS.

Number of Injector.	Size Connections. Water Suction & Supply to Boiler, in Inches.	Steam, in Inches.	Gallons per hour, 60 lbs. pressure.	Price	Number of Injector.	Size Connections. Water Suction & Supply to Boiler, in Inches.	Steam, in Inches.	Gallons per hour, 60 lbs. pressure.	Price.
3	⅜	⅜	65	$20 00	15	1½	1¼	1,280	$ 75 00
3½	½	⅜	90	21 00	17	1½	1¼	1,760	90 00
5	½	⅜	130	25 00	19	2	1½	2,260	110 00
7	¾	½	240	30 00	21	2	1½	2,860	125 00
9	¾	½	320	35 00	23	2½	2	3,480	150 00
11	1	¾	560	50 00	25	3	2½	4,620	200 00
13	1¼	1	960	60 00					

It will feed the water through a heater, thus utilizing the exhaust steam of an engine.

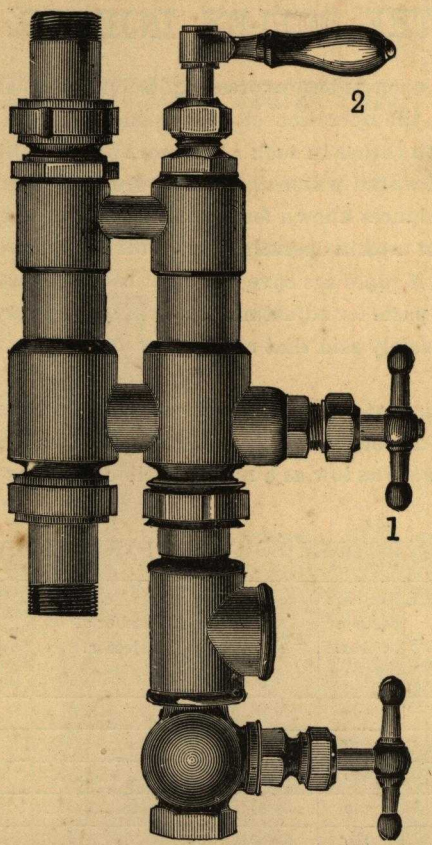
DIRECTIONS FOR CONNECTING AND OPERATING.

Connect as shown: "Steam," "Water," "To Boiler." In making steam connection with the boiler, do not connect with other steam pipes, but take the steam from the highest part of the boiler, so as to insure dry steam. Place a Globe Valve in steam pipe above the Injector, for a starting valve, and a check valve in the supply pipe between Injector and boiler, also a stop cock between check valve and boiler. Blow out steam pipes before connecting, and let water flow through suction pipe, so as to remove any lead, scales or other solids from the interior of them, and thus save trouble. The suction pipe must be perfectly tight when water is to be lifted.

To start the Injector, see that the overflow valves marked "B" and "C" are open. Give steam. After getting water, close valve "B;" if water still comes through overflow pipe, open valve "A," which, if, when open, water continues to flow from the waste pipe, close valve "C," and the Injector is forcing water into the boiler. A quarter turn opens or closes valve "A," and two-thirds of a turn closes or opens either one of the valves "B" or "C."

The conditions in different places vary so widely that each engineer must exercise judgment in the details of operating; of this no absolute rule can be given, but the mode of starting in any locality or under any conditions is fully covered by the directions given, and is left to the operator as to time required, and those little details which each engineer knows are necessary sequents and subject of judgment rather than instruction.

THE HANCOCK STATIONARY INSPIRATOR.



The best feeder known for Stationary, Marine and Locomotive Boilers; simple, reliable and always in order. Has no rival for pumping purposes; consumes less steam than any other boiler feeder known; requires no oiling.

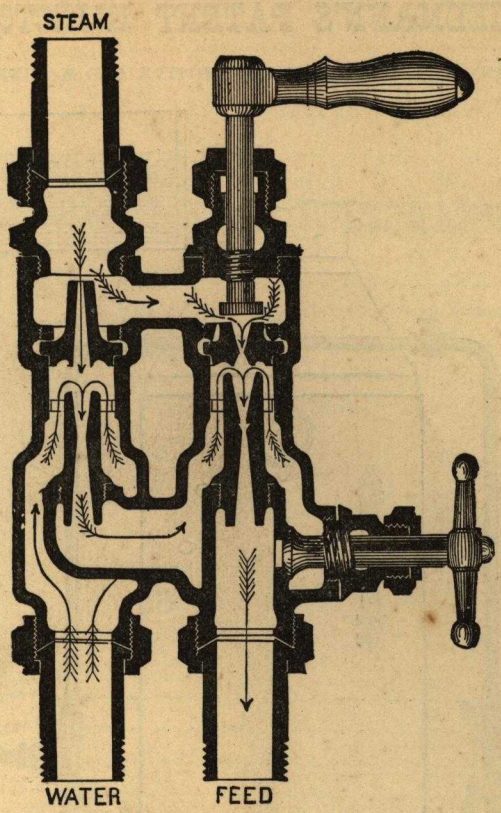
THE HANCOCK INSPIRATOR

Is the best appliance known for feeding all kinds of boilers, on account of its simplicity of operation, the great range of its duties, and the fact that all the steam used in operating it is returned to the boiler, there being no loss, excepting by radiation, from the pipes used in connecting. It differs materially in its construction from the class of boiler feeders known as Injectors, inasmuch as it has one set of tubes for lifting and another set of tubes for forcing water—a combination entirely new, reliable and efficient. There being no movable parts in its internal construction, it is not liable to get out of order; requires no oiling or adjusting to the various steam pressures or lifts, and is always ready to start at a moment's notice. Water can be delivered at a high or low temperature, as may be desired. No adjustment is required for varying steam pressures; all sizes will lift water 25 feet, working as well on a 25 feet lift as on a low lift. Each Inspirator is carefully tested before leaving the manufactory, and is guaranteed to perform all that is claimed, it being attached and operated according to the printed directions that accompany each machine.

NEW LIST.—April 1st, 1881.

No. of Inspirator.	SIZE CONNECTION.		Gallons per hour—60 lbs. pressure.	Price.	No. of Inspirator.	SIZE CONNECTION.		Gallons per hour—60 lbs. pressure.	Price.
	Suction and Feed Pipe.	Steam Pipe.				Suction and Feed Pipe.	Steam Pipe.		
7½	⅜	⅜	60	$16 00	25	1¼	1	900	$60 00
8¾	½	⅜	85	18 00	30	1½	1¼	1,260	75 00
10	½	⅜	120	20 00	35	1½	1¼	1,740	90 00
12½	¾	½	220	25 00	40	2	1½	2,230	110 00
15	¾	½	300	30 00	45	2	1½	2,820	125 00
17½	1	¾	420	40 00	50	2½	2	3,480	150 00
20	1	¾	540	45 00	55	2½	2	3,800	175 00
22½	1¼	1	720	55 00					

THE HANCOCK INSPIRATOR.

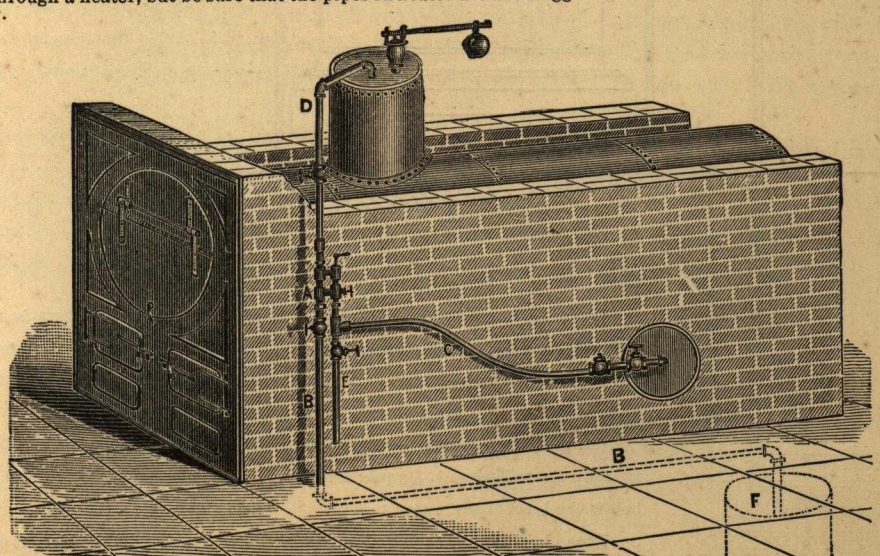


SECTIONAL VIEW.

The Hancock Inspirator is the Injector perfected. All sizes. Will lift water 25 feet. Delivers to boiler at comparatively high or low temperature, as desired. No adjustment required for varying steam pressures. Has no movable parts to get out of order. Boilers steam better and last longer with the Inspirator than with a pump.

DIRECTIONS FOR ATTACHING INSPIRATOR TO HORIZONTAL STATIONARY BOILER.

Place the Inspirator on the side of the boiler, as shown in the cut. Take steam direct from the highest point of the boiler, and do not connect with other pipes. Put a globe valve in the suction pipe, close to the Inspirator, for regulating supply of water to boiler. If the length of suction pipe from Inspirator to water exceeds ten feet, use a size larger than connections call for, reducing close to the Inspirator; this makes up for the friction of a long flow. The Inspirator will feed through a heater, but be sure that the pipes in heater are not clogged. Place a check valve between Inspirator and heater.



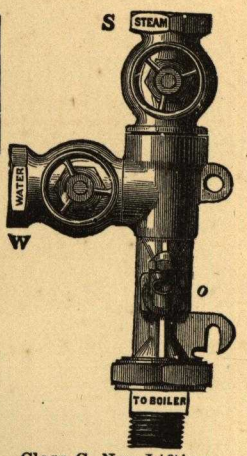
A—Stationary Inspirator. BB—Suction Pipe of Inspirator. C—Delivery Pipe to Boiler. D—Steam Pipe of Inspirator. E—Overflow Pipe of Inspirator. F—Well of Reservoir.

Pamphlets giving full information furnished on application.

FRIEDMANN'S PATENT INJECTORS,

FOR STATIONARY, PORTABLE, LOCOMOTIVE AND MARINE BOILERS.

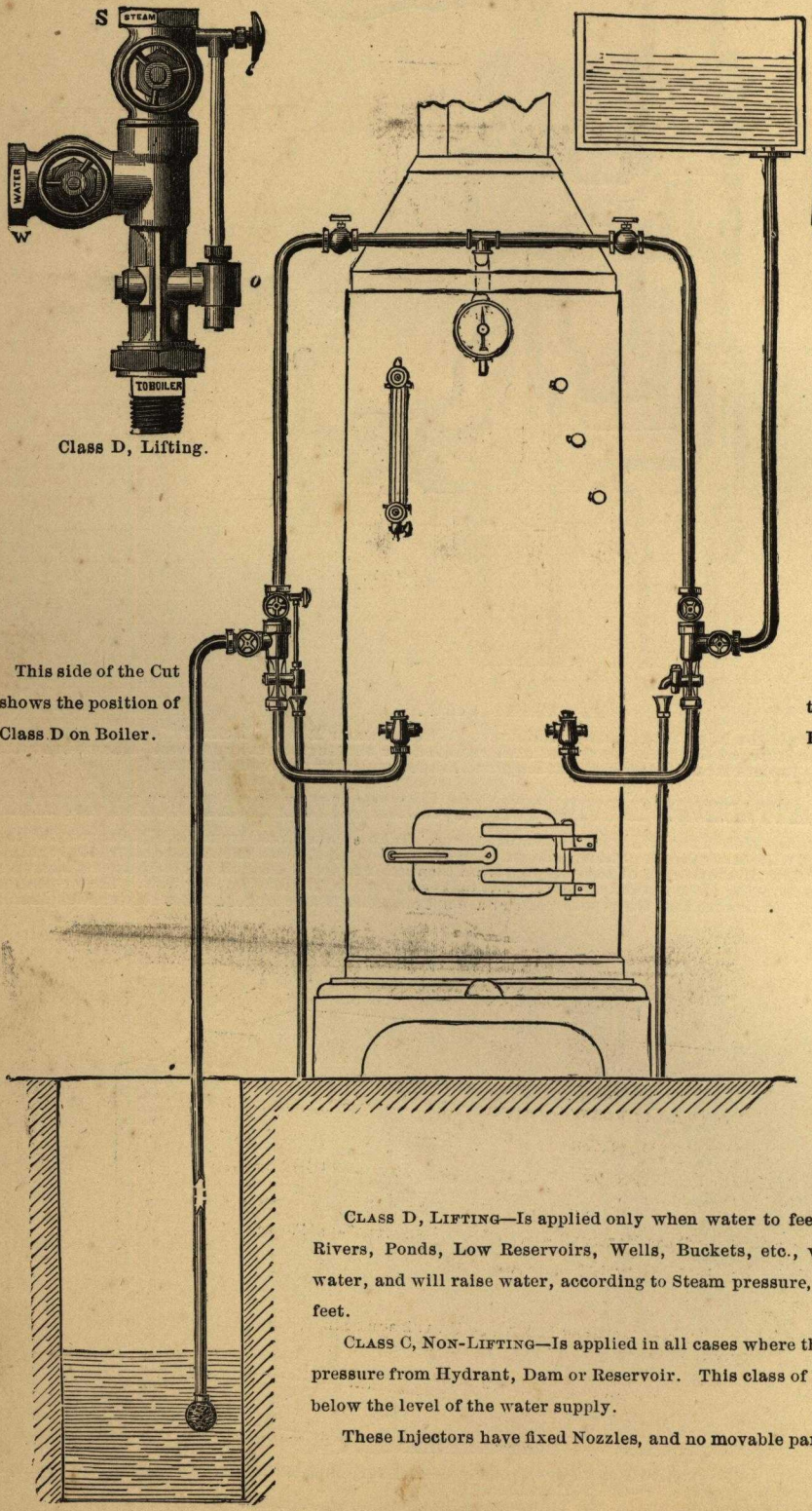
Class D, Lifting.



Class C, Non-Lifting.

This side of the Cut shows the position of Class D on Boiler.

This side of the Cut shows the position of Class C on Boiler.



CLASS D, LIFTING—Is applied only when water to feed Boilers is taken from Rivers, Ponds, Low Reservoirs, Wells, Buckets, etc., where there is no head of water, and will raise water, according to Steam pressure, from six to twenty-five feet.

CLASS C, NON-LIFTING—Is applied in all cases where there is a head of water or pressure from Hydrant, Dam or Reservoir. This class of Injector should be placed below the level of the water supply.

These Injectors have fixed Nozzles, and no movable parts to get out of order

CAPACITY AND PRICE LIST OF FRIEDMANN'S INJECTORS.

Size of Injector.	Minimum Inside Diameter of Pipe, in Inches.	Delivery per Hour, in Gallons, At a Steam Pressure of				Prices.	
		120 lbs.	80 lbs.	50 lbs.	20 lbs.	Class C, Non-Lifting.	Class D, Lifting.
Number 2	½	90	80	65	40	$21 00	25 00
Number 3	¾	220	180	140	90	35 00	42 00
Number 4	1	390	320	245	160	50 00	60 00
Number 5	1¼	630	500	400	250	65 00	70 00
Number 6	1¼	870	720	570	360	75 00	85 00
Number 7	1½	1,200	965	800	500	90 00	100 00
Number 8	1½	1,560	1,280	910	640	110 00	120 00
Number 9	2	1,980	1,620	1,380	810	130 00	140 00
Number 10	2	2,450	2,000	1,580	1,000	160 00	180 00
Number 12	2½		2,880	2,300	1,440	225 00	250 00
Number 14	2½		3,920	3,110	1,960	250 00	275 00
Number 16	3		5,120	4,100	2,560	300 00	325 00
Number 18	3		6,480	5,200	3,300		
Number 20	3½		8,000	6,400	4,000		

TO DETERMINE SIZE OF INJECTOR REQUIRED.

One nominal horse-power will generally require 7½ gallons of water per hour. In case of plain cylinder boilers, divide the number of square feet of heating surface by 10 for the horse-power. In case of flue boilers, divide by 12, and with multi-tubular boilers, divide by 15 for the nominal horse-power.

Parties ordering Injectors should state whether they want Lifting or Non-Lifting, and also will please give—

1. Number and kind of Boilers, with correct dimensions.
2. Steam Pressure—highest, lowest and average.
3. Distance of Water Supply horizontally from Injector. and height to be raised.

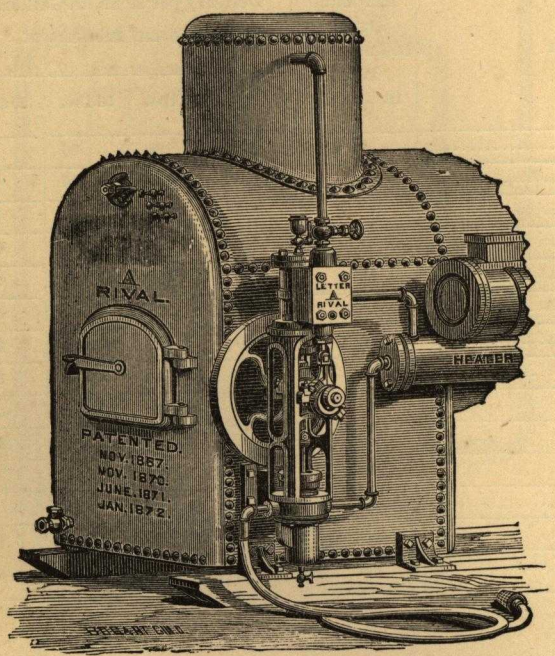
CHECK VALVES.

In view of the great trouble caused by the imperfect quality of check valves in general, and the necessity for good ones to use in connection with our Injectors, we have made some for this purpose. They are heavily constructed with improved Seat and warranted to keep tight.

Size, Inches	½	¾	1	1¼	1½	2	2½	3
Price	$1 25	1 50	2 00	3 00	4 00	7 00	14 00	18 00

THE RIVAL DOUBLE-ACTING STEAM PUMP,

WITH PATENT REMOVABLE WATER CYLINDER AND BRACKET TO FASTEN TO BOILER OR WALL.



THE RIVAL DOUBLE-ACTING STEAM PUMP,

WITH PATENT REMOVABLE WATER CYLINDER AND BRACKET TO FASTEN TO BOILER OR WALL.

The Rival can be run faster than any other Steam Pump.

The smallest size will raise water from well or cistern, and deliver a constant stream 50 to 70 feet from end of hose nozzle.

Use the Rival to supply your boiler, and save three-fourths of the steam required by the best constructed Injector or Inspirator to do the same work, and you will have a more effective use of your Boiler, and save a large percentage of fuel.

These Pumps will handle hot or cold water without changing any of the parts, and we guarantee a greater delivery with less power and at less cost than any other Steam Pump in use.

We furnish with each Bracket Pump a Crank and Handle to screw on the main shaft for pumping by hand, and for washing out or pumping up the boiler.

RIVAL BRACKET STEAM PUMP.

This Pump is fully described on page 502 and 504, except that it is constructed with Brackets, so that it may be attached to the side of a boiler or the wall.

TABLE OF SIZES, PRICES AND CAPACITIES OF VERTICAL "BRACKET PATTERN" RIVAL PUMPS.

Letter.	Diam. Steam Cylinder, Inches.	Diam. Water Cylinder.	Stroke, in Inches.	Size Steam Pipe.	Size Escape Pipe.	Size Suction Pipe.	Size Supply Pipe.	Revolutions per Minute.	Gallons per Minute.	Horse Power it will Feed.	Price.
O	2½	13-16	2	¼	½	½	⅜	130	1.25	10.0	$ 43 00
A	3	1½	2½	⅜	½	¾	½	120	2.20	18.4	54 00
B	3½	2	2½	⅜	½	¾	½	100	3.39	27.0	70 00
C	4	2½	3	½	¾	1¼	1	90	5.72	45.9	90 00
D	4½	3	3	½	¾	1½	1¼	85	7.72	62.0	108 00

PRICE OF THREE-WAY COCK FOR UTILIZING ESCAPE STEAM.

Price for Letter A and B, each	$1 70
Price for Letter C and D, each	2 00

PRICE OF SUCTION CONNECTION FOR UTILIZING ESCAPE STEAM.

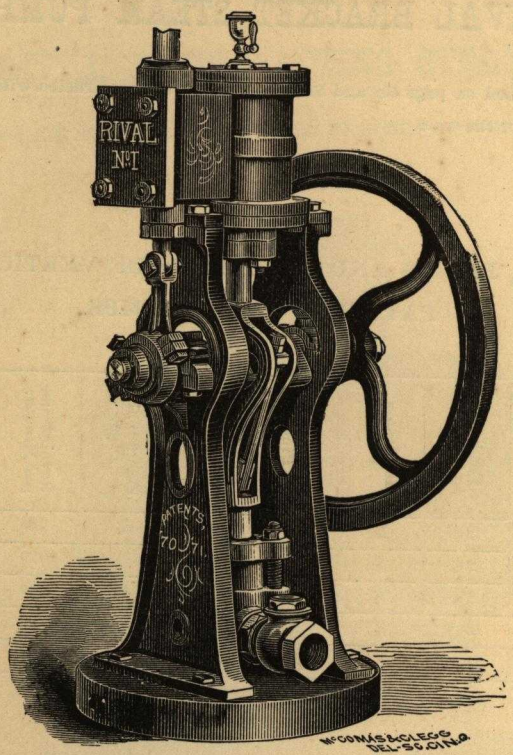
Price for Letter A and B, each	$2 00
Price for Letter C, each	2 50
Price for Letter D, each	3 50

When the Pump is wanted for condensing, it should be so stated in the order, as the escape pipe should be, for convenience, on the opposite side from that shown in the illustration.

The Drain Cock in the bottom is sometimes used for priming the Pump when first started, by submerging a vessel of water. In all cases the suction pipe should have a strainer.

VERTICAL STEAM PUMP, "THE RIVAL,"

FOR FEEDING BOILERS, FIRE PURPOSES, ETC.



This cut shows our Boiler Feeding Steam Pump, "The Rival." For strength, durability, ease of action, economy in the use of steam, compactness and cheapness, it stands pre-eminent. It is positive in its action, and can be run at high speed without jarring or straining any part. This Pump is single-acting, and will pump hot or cold liquids with equal facility. All parts are made interchangeable, so that duplicate pieces and repairs always fit. Engineers of stationary and semi-portable engines, or of steamboats, will find this Pump unequaled, as it takes so little space and requires scarcely any care or time in its management, except to start and stop it.

The Pumps listed on the table below will take water from the Stillwell, Armstrong, or other Heaters. The opening in the Heater should be as large as that in the Pump, and the Heater located above the Pump.

To pipe these Pumps to operate to best advantage, the inlet pipe should be as short as possible and full size, particularly when hot water is to be pumped.

If the inlet pipe is long, a vacuum chamber should be attached near the pump, which can be made by attaching an upright pipe in a Tee, and closed at the top end.

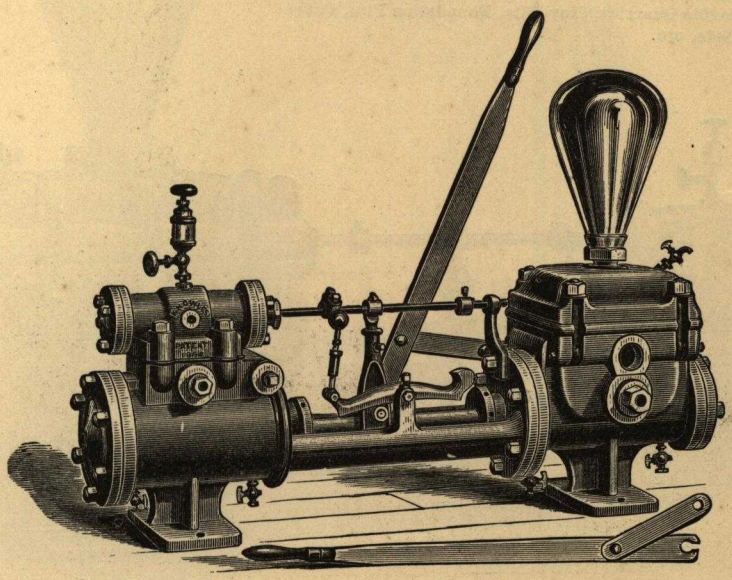
By the addition of an air chamber to the force pipe, made in the above manner, the Pump can be used for fire purposes. Every Pump warranted.

SIZES, CAPACITY AND PRICES.

	Diameter Steam Cylinder, in inches.	Diameter Water Plunger.	Stroke, in inches.	Size Steam Pipe.	Size Escape Pipe.	Size Suction and Supply.	Revolutions per Minute.	Gallons per Minute.	Horse Power it will Feed.	Prices.
Number 50	2½	1¼	2	¼	½	¾	110	1.05	8.5	$ 38 00
Number 1	3	1½	2½	⅜	½	1	100	1.89	15.0	49 00
Number 2	3½	2	2½	⅜	½	1	100	3.39	27.0	60 00
Number 3	4	2½	3	½	¾	1¼	90	5.72	45.9	71 00
Number 4	4½	3	3	½	¾	1½	85	7.72	62.0	88 00
Number 5	5	3½	4	¾	1	2	80	13.32	106.8	108 00
Number 6	6	4	5	1	1¼	2½	75	20.48	163.5	160 00

KNOWLES' PATENT HEAVY PRESSURE PUMPS, FOR BOILER FEEDING, Etc.

ARRANGED FOR HOT OR COLD WATER.



Above cut represents regular Boiler Feed Pump Nos. 3 and 4, showing new Patent Valve Motion, and Hand Power Lever attached and detached. Independent Steam Pumps have especial advantage on Boiler Feeding, inasmuch as speed can be adjusted automatically or otherwise, to run continuously and maintain water at uniform height. Our Hand Power attachment, secured to us by Letters Patent, is the only reliable appliance of its kind. It is not subject to the disadvantages of the great friction incident to a lever sliding on a pin, and does not necessitate the cutting away of any part of the Pump to attach it. It is invaluable for filling boilers when steam is down, fire purposes, etc. When Pump is under steam, the Hand Lever can be removed by simply lifting it from its rests.

These Pumps are constructed in the most substantial manner. All working parts are of Gun Metal (Government Standard), or of Phosphor Bronze. The Air-chambers are of hammered Copper (not spun up), and are tested under severe pressure. Both Steam and Water Cylinders are fitted with Self-Adjusting Pistons; consequently the Pumps work perfectly in hot or cold water, and are always tight when changed suddenly from one to the other.

PRICE LIST OF REGULAR SIZES.

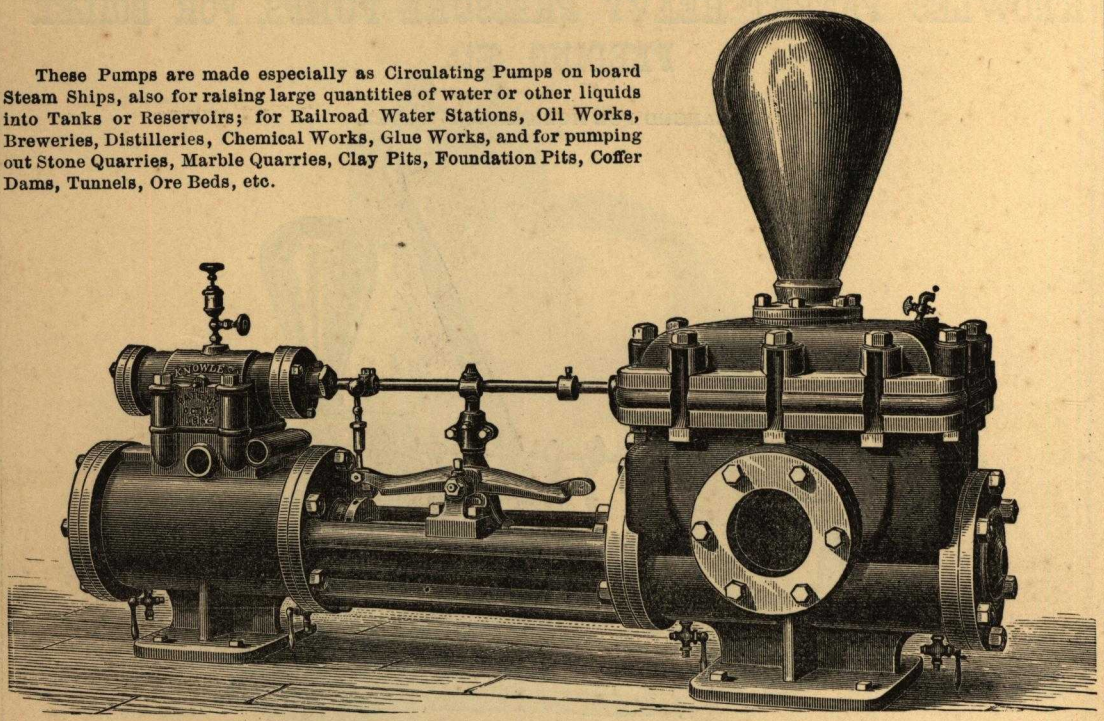
Size of Pump No.	Diameter Steam Cylinder, in Inches.	Diameter Water Cylinder, in Inches.	Length of Stroke, in Inches.	Gallons per Stroke.	Strokes per Minute.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.	New Price, Complete.
000	2½	1½	3	.03	1 to 300	¼	⅜	½	⅜	$35 00
00	3	1¾	3	.04	1 to 300	¼	⅜	¾	½	50 00
0	3¼	2	4	.05	1 to 300	⅜	¾	1¼	1	85 00
1	3½	2¼	4	.07	1 to 300	½	¾	1¼	1	125 00
2	4	2½	5	.11	1 to 300	½	¾	1¼	1	150 00
3	5	3¼	7	.25	1 to 275	¾	1	2	1¼	200 00
4	5½	3¾	7	.34	1 to 275	¾	1	2	1½	225 00
4½	7	4	7	.39	1 to 275	1	1¼	2½	2	275 00
5	7	4½	10	.69	1 to 250	1	1¼	3	2½	350 00
6	7½	5	10	.85	1 to 250	1	1¼	3	2½	375 00
6½	8	5	12	1.02	1 to 250	1	1¼	4	4	400 00
7	10	6	12	1.46	1 to 200	1¼	1½	4	4	450 00
8	12	7	12	1 99	1 to 200	2	2½	5	5	525 00
9	14	8	12	2.61	1 to 200	2	2½	5	5	600 00
10	16	10	16	5.43	1 to 200	2½	3	6	6	.....
11	18	12	24	11.75	1 to 180	3½	4	8	6	.....

LARGE SIZES OR DIFFERENT PROPORTIONS TO ORDER.

These Pumps can safely be run at a speed that makes them an efficient Fire Pump. Orders by telegraph bring the desired parts by first express, as we make everything actually interchangeable and to fit. Send for Steam Pump Catalogue.

TANK PUMPS, for Light Service.

These Pumps are made especially as Circulating Pumps on board Steam Ships, also for raising large quantities of water or other liquids into Tanks or Reservoirs; for Railroad Water Stations, Oil Works, Breweries, Distilleries, Chemical Works, Glue Works, and for pumping out Stone Quarries, Marble Quarries, Clay Pits, Foundation Pits, Coffer Dams, Tunnels, Ore Beds, etc.



(Cut above represents size 8-inch Steam Cylinder, 8-inch Water Cylinder, 12-inch stroke.)

Railroad Superintendents and Master Mechanics are requested to examine the merits of these Pumps for Tanks at Watering Stations. These Pumps are arranged for pumping hot or cold, thick or thin liquids, as desired. Pumps are made with a removable cylinder bushing, when required to pump water containing sand or grit, at a slight additional cost. In elevating liquids to limited heights and short distances, these Pumps possess special advantages, as they combine great pumping capacity with small expenditure of steam and diminished original cost. Being built from special and improved patterns, they are arranged to work perfectly on liquids of any consistency, either hot or cold.

FOR MARINE WORK.—As Circulating Pumps for surface condensers, these Pumps have no equal, as they run without shock or "pounding," require the least power to work them, and, being of the very finest material and workmanship, combine simplicity, durability and immunity from repairs, in the highest possible degree. For pumping bilge and general ship work, they are very superior, as the large passages and free opening valves prevent all clogging of the Pumps. As a Wrecking Pump they combine great capacity with lightness, compactness and accessibility.

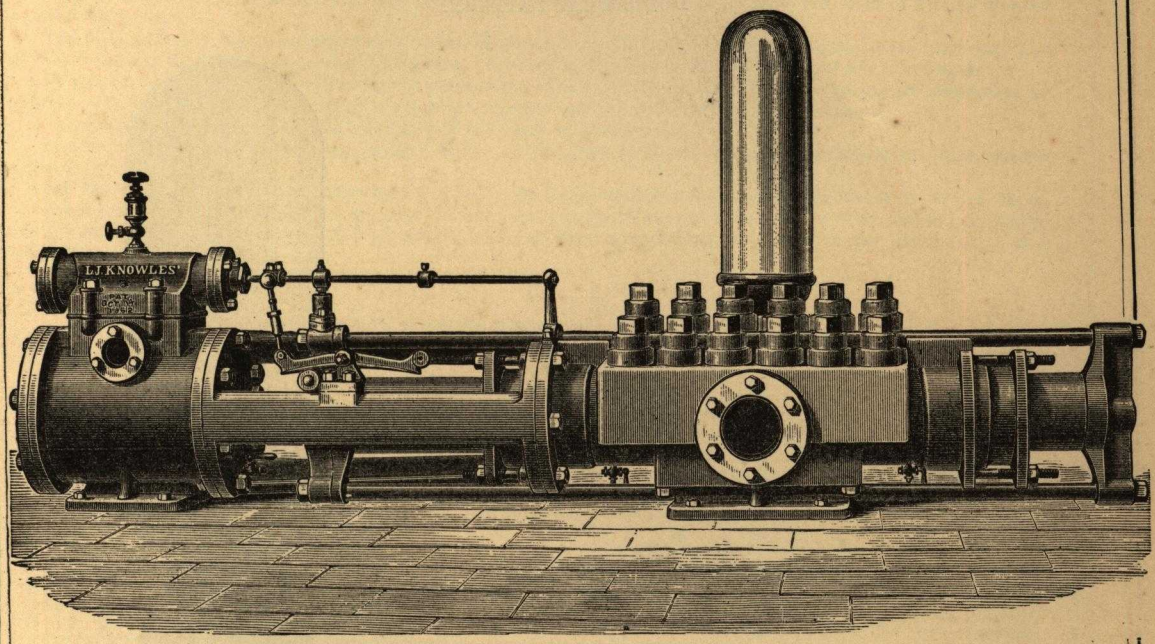
PRICES AND DIMENSIONS.

Diameter Steam Cylinder.	Diameter Water Cylinder.	Length of Stroke.	Gallons per Stroke.	Strokes per Minute.	Extreme Length, in Inches.	Extreme Width, in Inches.	Size of Steam Pipe.	Size of Exhaust Pipe.	Size of Suction Pipe.	Size of Disch'ge Pipe.	Price.
4	4	5	0.27	1 to 300	34	8⅜	½	¾	2	1½	$175 00
5	4	7	0.39	1 to 300	44	12	¾	1	2½	2	238 00
5½	5½	7	0.72	1 to 300	44	13½	¾	1	3	2½	300 00
6	5½	7	0.72	1 to 300	44	13¼	¾	1	3	2½	300 00
7½	7	10	1.64	1 to 275	56½	19	1	1¼	4	4	375 00
7½	7½	10	1.91	1 to 275	56½	19	1	1¼	5	5	375 00
8	6	12	1.74	1 to 250	66¾	19	1	1¼	4	4	400 00
8	7	12	1.99	1 to 250	66¾	19	1	1¼	5	5	425 00
8	8	12	2.61	1 to 250	66¾	20	1	1¼	5	5	450 00
8	10	12	4.06	1 to 250	66¾	21½	1	1¼	6	6	500 00
10	10	12	4.06	1 to 250	66¾	21½	1¼	1½	6	6	550 00
10	12	12	5.87	1 to 200	66¾	23¾	1¼	1½	8	6	600 00
10	10	16	5.43	1 to 200	78½	21½	1¼	1½	6	6	650 00
10	12	16	7.83	1 to 200	78½	23¾	1¼	1½	8	6	
12	10	12	4.06	1 to 250	66¾	21½	2	2½	6	6	
12	12	12	5.87	1 to 200	66¾	23¾	2	2½	8	6	
12	10	16	5.43	1 to 200	78½	21½	1¼	1½	8	6	
12	12	16	7.83	1 to 200	78½	23¾	2	2½	8	6	
14	12	12	5.87	1 to 200	66¾	23¾	2	2½	8	6	
14	12	16	7.83	1 to 200	78½	23¾	2	2½	8	6	
14	14	16	10 66	1 to 150	78½	27	2	2½	10	8	
14	14	24	16 00	1 to 150	108	27	2½	3	10	8	
14	16	24	20.88	1 to 150	108	35½	2½	3	12	10	
16	14	24	16.00	1 to 150	108	27	2½	3	10	8	
16	16	24	20.88	1 to 150	108	35½	2½	3	12	10	
16	18	24	26.44	1 to 150	108	38	2½	3	12	10	
16	20	24	32.64	1 to 150	108	40	2½	3	14	12	
18	16	24	20.88	1 to 150	110	35½	3½	4	12	10	
18	18	24	26.44	1 to 150	110	38	3½	4	12	10	
18	20	24	32.64	1 to 150	110	40	3½	4	14	12	
18	22	24	39.50	1 to 150	110	42	3½	4	14	14	
20	18	24	26.44	1 to 150	118	38	3½	4	12	10	
20	20	24	32.64	1 to 150	118	40	3½	4	14	12	
20	22	24	39.50	1 to 150	118	42	3½	4	14	14	
20	24	24	47.00	1 to 150	118	44	3½	4	16	16	

Auxiliary Plunger Feed Pumps attached when required, at a small additional cost. Prices of Pumps, with water cylinders made entirely of composition, extra.

PLUNGER PUMPS,

FOR FEEDING BOILERS AND PUMPING WATER CONTAINING SEDIMENT OR GRITTY MATTER.



Greatest Strength. Utmost Durability. Water Cylinder and Valve Patented. These Pumps have points of excellence for pumping under extremely severe duty not found in any other Pump. Water Cylinder and Chest in one piece, without bolts or joints. Cap valves with removable seats. Plungers from government standard gun metal.

Plunger Pumps for Boiler feeding have advantages over Piston Pumps for pumping gritty or impure water at any temperature, and are exceedingly durable—the only wearing point upon the Plungers being the packing in the stuffing-boxes, which are outside. Any leak can thus be instantly detected. They are specially desirable in places where the work is very severe and continuous, such as Sugar Refineries, Rolling Mills, Furnaces, etc.

As a Feed Pump on the Steamboats of Western and Southern Rivers they have no equal, and are rapidly displacing the cumbersome "Doctors" commonly in use.

PRICE LIST.

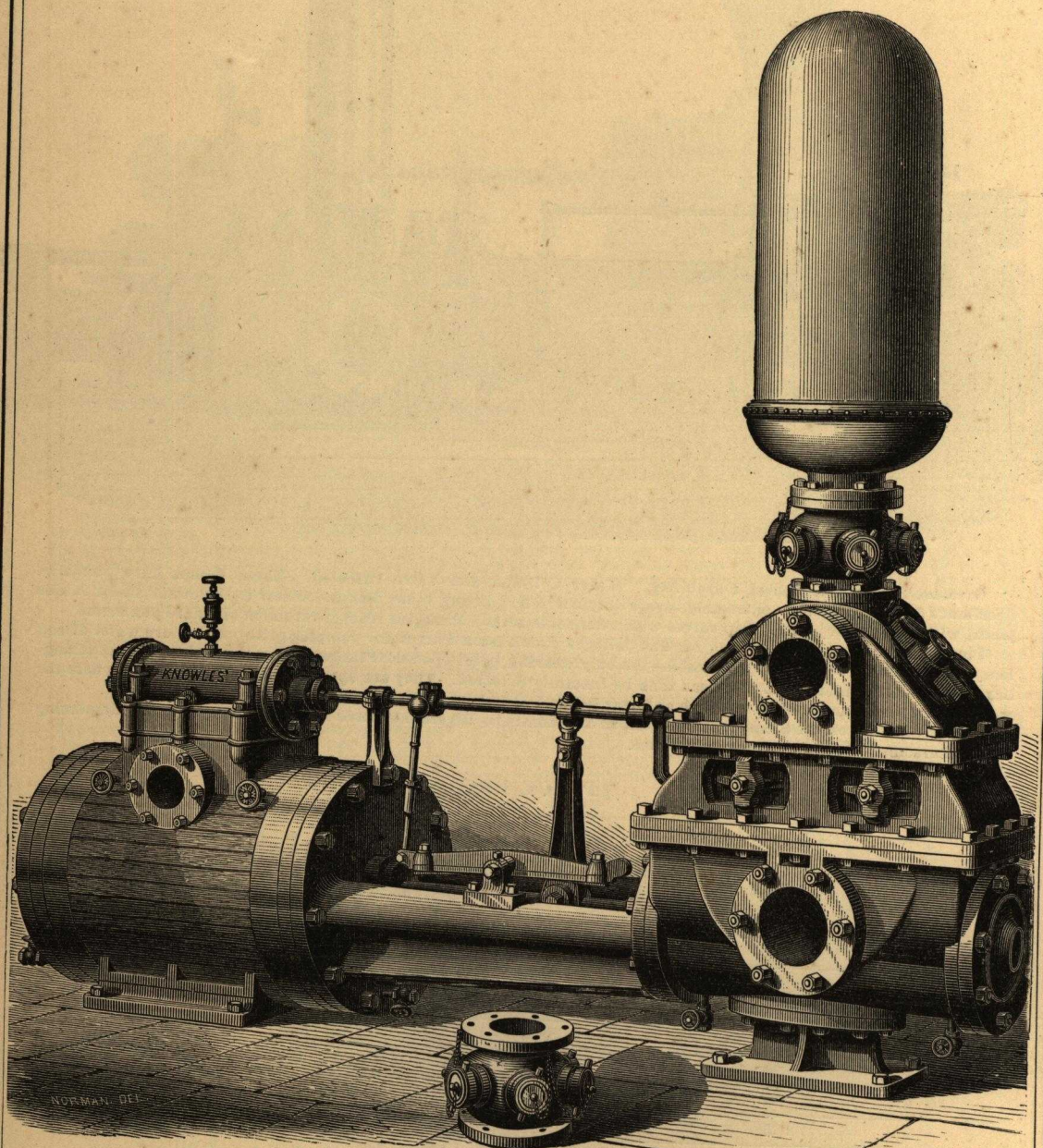
Number.	Diameter of Steam Cylinder, in Inches.	Diameter of Water Plungers, in Inches.	Length of Stroke, in Inches.	Gallons per Stroke.	Strokes per Minute Capable of Running.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.	Price.
3	5½	3½	7	0.25	1 to 300	¾	1	2	1½	$275 00
4	6	3¾	7	0.34	1 to 300	¾	1	2	1½	300 00
5	7½	4½	10	0.69	1 to 275	1	1¼	3	2½	450 00
6	8	5	10	0.85	1 to 275	1	1¼	3	2½	475 00
7	12	6	12	1.46	1 to 250	2	2½	4	4	650 00
8	14	7	12	2.00	1 to 250	2½	3	5	5	
9	16	8	12	2.61	1 to 250	2½	3	5	5	
10	18	10	16	5.43	1 to 200	2½	3	6	6	

For larger sizes, see pages 514 to 515.

In situations requiring Pumps to work fluid containing sediment, gravel, or any substance liable to cut or wear its working parts, or on extremely heavy duty, we most strongly advise the use of our Plunger Pumps as being far more efficient, durable and reliable than any other Pump.

FIRE PUMPS.

DOUBLE CAP PATTERN.



(Engraving represents No. G Fire Pump, Double Cap Pattern, with Six-Way Hose Connection attached.)

Every Pump is thoroughly proved at the works, and run playing through Hose from one to four hours under the most severe tests. Every Pump furnished under complete guarantee.

FIRE PUMPS—Continued.

DOUBLE CAP PATTERN.

These are the most powerful and efficient Steam Fire Pumps ever produced.

They are built from new and special patterns, and are fully adapted to the peculiar and severe labor they have to perform.

The Ports and Valve openings are very direct and nearly twice as large as any other make of Pumps of same diameters of cylinders.

The New Patented Compensating Steam Valve Chest, used for this class of Pumps, is the most important and valuable invention that has been produced for years. It has no equivalent in the production of any other maker.

By this arrangement the Valve-Driving Piston is enclosed in a Gun-Metal Case, thus preventing any adherence by corrosion or expansion, and insuring instant starting under the most urgent or trying circumstances.

These features will be appreciated by engineers and users of Fire Pumps.

Pistons, Piston Rods, Valve Seats, Stuffing Boxes and Linings of Water Cylinders, of Gun-Metal (Government Standard).

The Valves can be reached instantly above and below, by the loosening of one nut on either side of the Water Chest.

There are Suction and Discharge openings on both sides of the Pump, and, in addition to the regular discharge outlets, can furnish, when required, Two, Four and Six-Way Hose Connections, as shown in the illustration, at a slight additional cost.

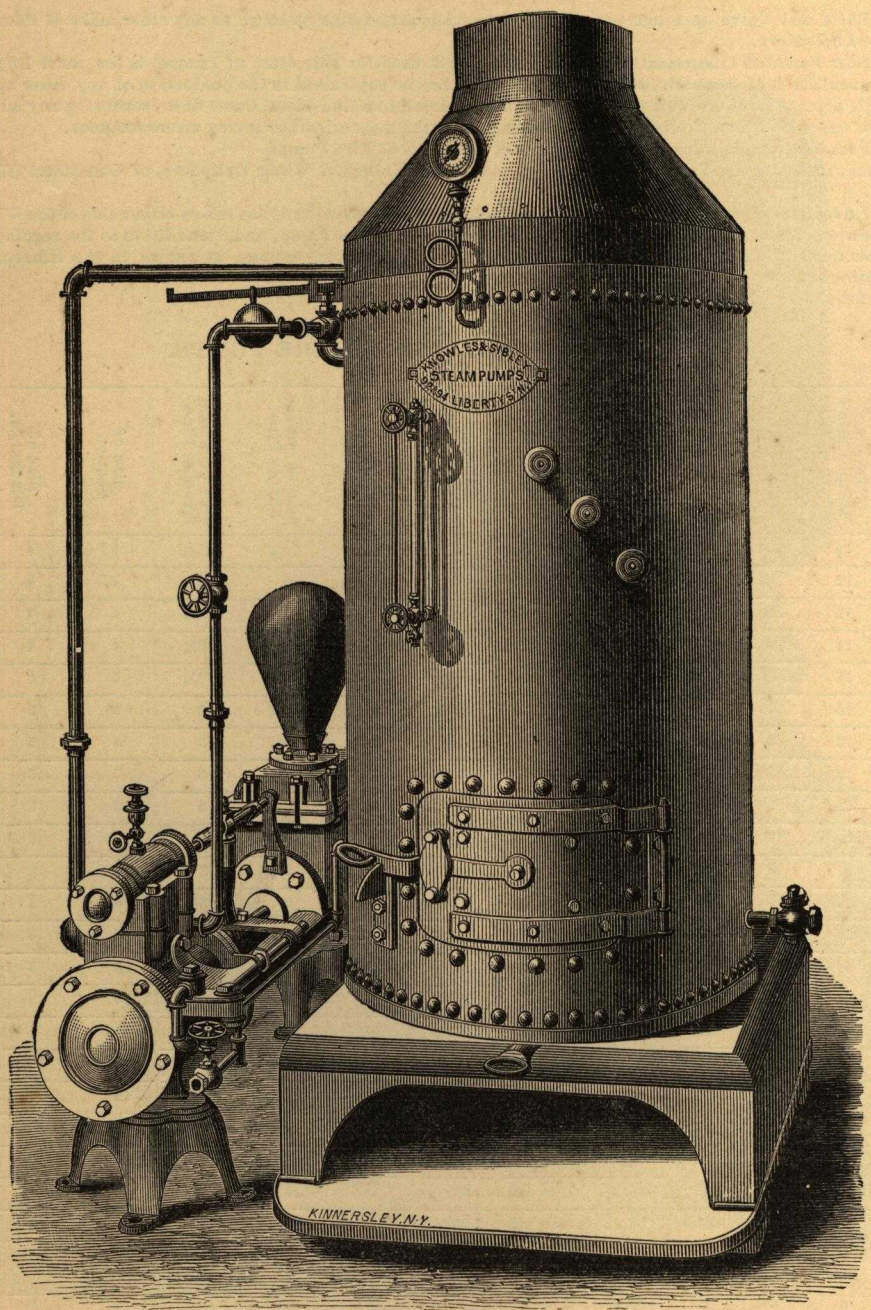
This form of Pump is secured by Letters Patent.

REDUCED PRICE LIST OF FIRE PUMPS.

Number.	Diameter Steam Cylinder, in inches.	Diameter Water Cylinder, in inches.	Length of Stroke, in inches.	Gallons per Stroke.	Strokes per Minute.	Extreme Length, in Inches.	Extreme Width, in Inches.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.	Price.
A	10	5	12	1.02	1 to 250	67	16½	1¼	1½	4	4	$425 00
AA	12	5	12	1.02	1 to 250	67	16½	2	2½	4	4	450 00
B	12	6	12	1 46	1 to 250	67½	16⅝	2	2½	4	4	500 00
BB	14	6	12	1.46	1 to 250	67½	16⅝	2	2½	4	4	525 00
C	14	7	12	1.99	1 to 250	69½	18⅛	2	2½	5	5	600 00
CC	16	7	12	1.99	1 to 250	69½	20¼	2½	3	5	5	
D	16	8	16	3 48	1 to 200	75	20¼	2½	3	5	5	
DD	18	8	16	3.48	1 to 200	77¾	23	2½	3	5	5	
E	18	9	24	6.60	1 to 200	108	23	2½	3	6	6	
EE	20	9	24	6 60	1 to 200	108	25½	2½	3	6	6	
F	20	10	24	8.16	1 to 200	108	25½	2½	3	6	6	
FF	22	10	24	8.16	1 to 200	108	28	3	3½	6	6	
G	24	12	24	11.75	1 to 175	109	30	3	4	8	6	
GG	26	12	24	11.75	1 to 175	109	34	3½	4	8	6	
H	28	14	24	15.95	1 to 175	112	36	4	4½	10	8	
HH	30	14	24	15.95	1 to 175	112	39½	4	5	10	8	
I	32	16	24	20.88	1 to 175	114	40⅝	4½	5	12	10	
II	34	16	24	20.88	1 to 175	114	41½	4½	5	12	10	
J	36	18	24	26.43	1 to 150	114	42	4½	5	12	10	
JJ	38	18	24	26.43	1 to 150	114	44	5	6	12	10	
K	42	20	36	48.96	1 to 125	165	48	5	6	14	12	
KK	42	22	36	59.23	1 to 125	165	48	6	8	16	14	
	SHORT STROKE.											
D	16	8	12	2.61	1 to 250	69½	20½	2½	3	5	5	
E	18	9	16	4 40	1 to 250	84	25½	3½	4	6	6	
F	20	10	16	5.44	1 to 250	84	25½	3½	4	6	6	
FF	22	10	16	5.44	1 to 250	84	28	4	4½	6	6	

Strength and durability aimed at in every part, and the workmanship and finish cannot be excelled. A reduction in rates of insurance is always obtained where these Fire Pumps are in use.

COMBINED BOILER AND PUMP.



(Cut represents 7½ inch Tank Pump, with Feed Pump attached, and Upright Tubular Boiler complete.)

These Machines combine safety, simplicity and efficiency, in the highest possible degree. The Boilers and Fittings are of the best manufacture, and are thoroughly and severely tested before leaving the works.

COMBINED BOILER AND PUMP—Continued.

Complete with Feed Pump, Boiler, Boiler Base, Base Plate, Grates, Smoke Bonnet, Steam Gauge, Water Gauge, Gauge Cocks, Blow-off Cocks, Safety Valve, together with the Steam Pipes, Exhaust Pipes and Feed Pipe, with their necessary Valves, Unions, etc., entire and ready for operation. This is offered as the most compact, effective, durable and at the same time simple Machine for forcing water from Springs or Rivers to Hotels, Public or Private Institutions, Residences, Railway Stations, Brick Yards, Breweries, etc. Hand Power attachment on the smaller sizes.

REDUCED PRICE LIST OF BOILERS AND PUMPS, COMPLETE.

Size of Pump, No.	Diameter Steam Cylinder, in Inches.	Diameter Water Cylinder, in Inches.	Length of Stroke, in Inches.	Gallons per Stroke.	Strokes per Minute.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.	Price with Boiler and Fittings Complete.
1	3	2¼	4	0.07	1 to 300	½	¾	Two 1¼	Two 1	$325 00
2	4	2½	5	0.11	1 to 300	½	¾	Two 1¼	Two 1	350 00
3	5	3¼	7	0.25	1 to 275	¾	1	Two 2	Two 1½	450 00
4	5½	3¾	7	0.34	1 to 275	¾	1	Two 2	Two 1½	475 00
4½	7	4	7	0.39	1 to 275	1	1¼	Two 2½	Two 2	525 00
5	7	4½	10	0.69	1 to 250	1	1¼	Two 3	Two 2½	675 00
6	7½	5	10	0.85	1 to 250	1	1¼	Two 3	Two 2½	700 00
6½	8	5	12	1 02	1 to 250	1	1¼	4	4	725 00
7	10	6	12	1.46	1 to 200	1¼	1½	4	4	
8	12	7	12	1.99	1 to 200	2	2½	5	5	

REDUCED PRICE LIST TANK PUMPS AND BOILERS, COMPLETE.

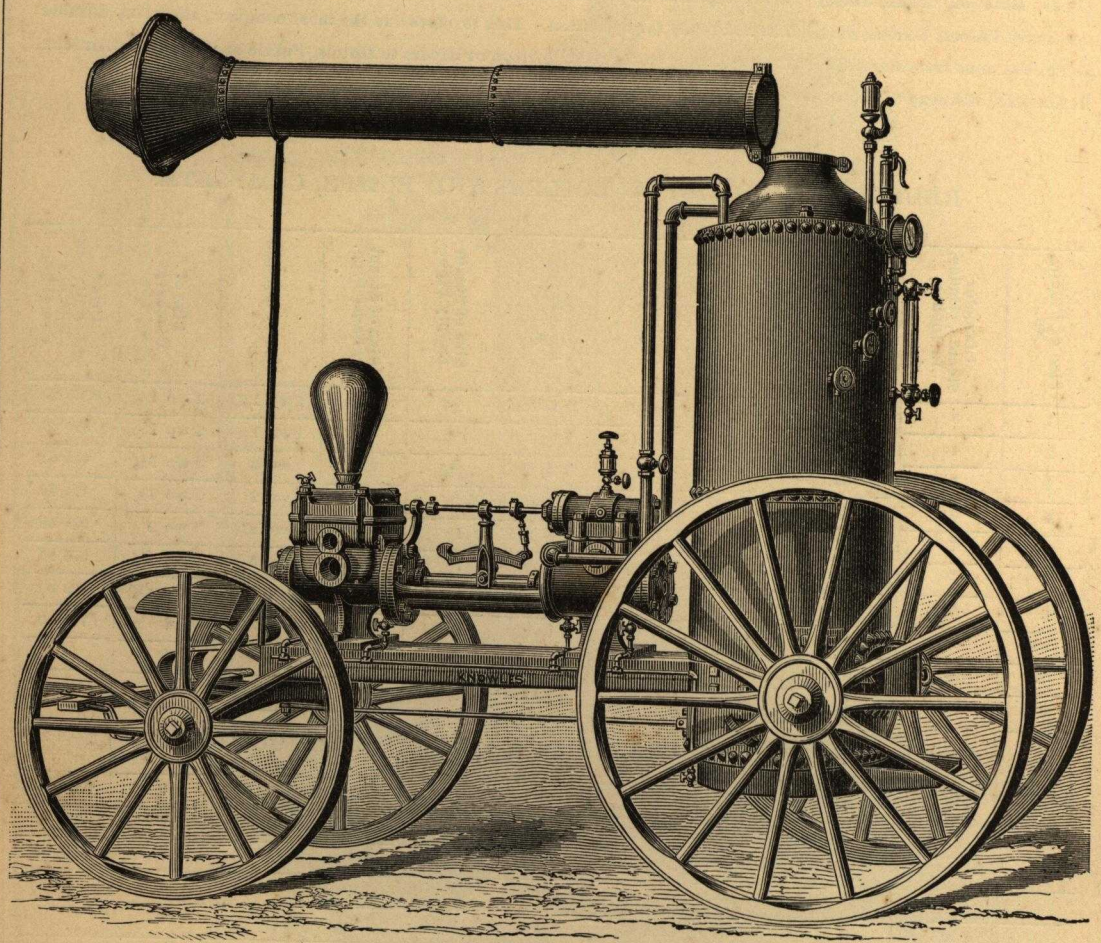
	4	4	5	0.27	1 to 275	½	¾	1¼	1	$375 00
	5½	5½	7	0.72	1 to 275	¾	1	3	2	525 00
	7½	7½	10	1.99	1 to 275	1	1¼	4	3	700 00
	8	8	12	2 65	1 to 250	1	1¼	5	5	
	10	10	16	5 43	1 to 250	1¼	1½	6	6	

Larger sizes, with upright or horizontal tubular, locomotive or patent Boilers to order at short notice. Any desired style of Boilers furnished at lowest market price. All parts are numbered, so that no mistake can occur in connecting them, should it be necessary to disconnect the parts for transportation. The attention of Railroad Men is particularly asked to the especial advantage of this Pump, as a supply Pump for Tanks at Watering Stations. The entire arrangement is most compact and complete, and can be placed at the point from which the water is to be taken, and the water forced by it to the distance and height required. It does not require the attention of a skilled mechanic to operate it, as it is furnished with all appliances the most complete. Its entire management can be learned in a few hours. We have built and have more Pumps in actual operation than any other makers in the world. Can perfectly duplicate every part.

COMBINED BOILER AND PUMP—Continued.

PORTABLE BOILER AND PUMP.

MOUNTED ON WHEELS AND COMPLETE, WITH ALL FIXTURES, FOR IRRIGATING, DRAINAGE AND FIRE SERVICE, ALSO FOR GENERAL USE ABOUT PUBLIC AND PRIVATE GROUNDS.



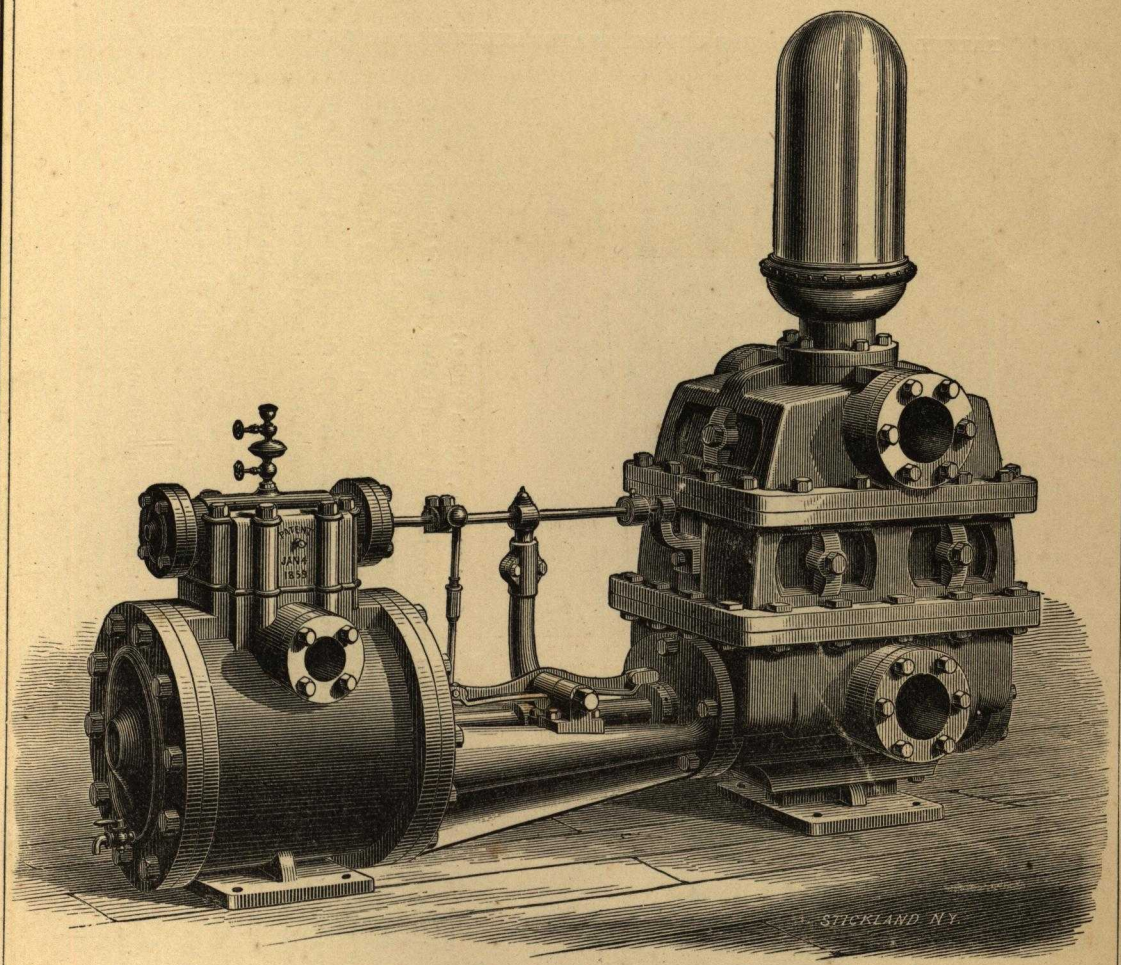
(Engraving represents 6-Horse Power Boiler and No. 4 Pump.)

Above engraving represents one size of our Portable Steam Boilers, with Steam Pump and connections, complete. This arrangement has many advantages over other mounted Boilers and Pumps heretofore offered. The Steam Pump is conveniently placed, and being separate from the Boiler, is not affected by the heat of the latter. This Portable Pump and Boiler was designed expressly for the West Indies and South American trade, and is especially adapted to rough roads; it is of very light draft, being mounted on high wheels, and can be easily moved from one place to another with steam up. Two horses or a yoke of oxen are able to transport it. It cannot be upset, because three-fourths of the entire weight rests immediately above and below the axles. The bottom of the ash pan is fifteen inches above the ground, and by removing it you have nearly two feet clear under the Engine. The boiler is made in the strongest manner possible, of the best Pennsylvania C. H. No. 1 Wrought Iron throughout. The running gear is of the most approved form. Prices and dimensions given on application. We also furnish Steam Pumps and Vertical Boilers mounted on low platform trucks, with broad-faced wheels of small diameter.

Every machine fully warranted.

MINING PUMPS,

PISTON PATTERN.



(Engraving represents Pump, 16 inches diameter Steam Cylinder; 10 inches diameter Water Cylinder; 20 inches Stroke. "Double Cap" Pattern.)

We are prepared to furnish machinery, under guaranty, for pumping deepest mines. We have Pumps working under head upwards of 1,300 feet vertical, and giving perfect satisfaction. We are enabled to do this without special strain on pipes or connections, as we build the only Pump made working absolutely without shock or jar on Pump or pipes, under the heaviest lifts. These features guaranteed. As the "Knowles" has always been the best constructed, both in material and workmanship, it requires less attention and repairs than any other form or make of Pumping Engine. The steam valve motion and general arrangement of the Steam Cylinder, as before described, is now brought to such a degree of perfection by late improvements as to leave nothing to be desired, and makes the Knowles Mining Pump by far the most economical, durable and efficient pumping engine extant. Wherever the "Knowles" has been placed in competition with other pumps, it has shown its great supremacy in economy of steam, as well as in strength and freedom from derangement. The "Knowles Mining Pump," as now improved and perfected, has no equal in any class of work. By means of our patent improved valve motion the Knowles Pump makes full and complete stroke, and always uniform; and by thus bringing the Water Piston close to Cylinder Heads, delivers a greater per centage of water than any other direct acting Pump. We have Pumps called 24-inch stroke that are running 25½ inches.

The Knowles Steam Pump Works have the largest variety of patterns of any house in the world for Pumping Machinery, in which no expense has been spared to embody all the latest improvements. They are thus enabled to offer machines readily adapted to the peculiar requirements of any situation. For price, see page 515.

We publish a special and complete circular of Mining Pumps, which will be sent on application.

DOUBLE-ACTING MINING PLUNGER PUMPS.

PATENT SOLID CYLINDER PATTERN. WATER CYLINDER AND VALVE PATENTED.

(Engraving represents Pumps having 24-inch Steam Cylinder, 7-inch Plunger, 24-inch Stroke.)

This peculiar form of Mining Pump is original with us and entirely new, and has many advantages not found in other forms of Plunger Pumps. The heavy castings, absence of joints, and peculiar arrangement of Valves and Plungers, render this Pump exceedingly durable. The only wearing point in entire water end being the packing in the outside stuffing-boxes, any leak is instantly detected, and all annoyance of disarrangement obviated. It is provided with two Hand Hole Plates, by simple removal of which the working barrel can instantly be cleaned without any disconnecting. There are no joints to pack or bolts to break or strip. The plunger does not pass through abutment or stuffing box in centre of Cylinder, but is "outside connected," and it is not possible for any liquid to pass the Plunger from one end of Cylinder to the other. By this arrangement of connecting the Plunger outside the Cylinder the displacement at each stroke and at both ends of Cylinder is equal, the flow uniform and speed regular. This is the only form of Pump found to give full satisfacton on lifts upwards of 700 feet vertical, in a single lift. They are made from special patterns, very heavy and fully guaranteed, working without shock or jar.

For complete description of our various Mining Pumps, send for Mining Pump Circulars.

MINING PUMPS—Continued.

Our experience in building Pumping Engines for Mines in all parts of the world has proved that no one form of Pumping Engine can fully meet the requirements of mines in different sections, or of those in the same locality working under different conditions. Consequently, we have, at great expense, designed and constructed the several different styles which we here describe, believing that they fully cover the requirements of the various mines.

DETAILS AND REDUCED PRICES.

Diameter Steam Cylinder, in Inches.	Diameter of Plungers.	Length of Stroke, in Inches.	Gallons per Stroke.	Strokes per Minute.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge.	PRICES.		
									Piston Pumps.		Plunger Pumps.
									Regular Pattern.	Removable Cylinder Pattern.	
5½	3¼	7	.25	1 to 300	¾	1	2	1½	$200.00	$225.00	$275.00
6	3¾	7	.34	1 to 300	¾	1	2	1½	225.00	250.00	300.00
7½	4½	10	.69	1 to 275	1	1¼	3	3	350.00	400.00	450.00
8	5	10	.85	1 to 275	1¼	1½	3	3	375.00	440.00	475.00
10	5	12	1.02	1 to 275	1¼	1½	4	4	425.00	500.00	550.00
10	6	12	1.46	1 to 250	1¼	1½	4	4	450.00	525.00	600.00
12	6	12	1.46	1 to 250	2	2½	4	4	500.00	575.00	650.00
12	7	12	1 99	1 to 250	2	2½	4	5	525.00	625.00	700.00
14	7	12	1 99	1 to 250	2	2½	5	5			
14	8	12	2.61	1 to 250	2½	3	5	5			
16	8	12	2.61	1 to 250	2½	3	5	5			
16	9	16	4.40	1 to 250	2½	3	6	6			
18	10	16	5.43	1 to 200	2½	3	6	6			
18	10	24	8.16	1 to 150	3	3½	10	8			
20	10	24	8.16	1 to 150	3½	4	10	8			
24	10	24	8 16	1 to 150	4	4½	10	8			
30	10	24	8.16	1 to 150	5	6	10	8			
20	12	24	11.75	1 to 125	3½	4	10	8			
24	12	24	11.75	1 to 125	4	4½	10	8			
30	12	24	11.75	1 to 125	5	6	10	8			
20	14	24	16.00	1 to 125	3½	4	12	10			
24	14	24	16.00	1 to 125	4	4½	12	10			
30	14	24	16.00	1 to 125	5	6	12	10			
24	16	24	20.80	1 to 100	4	4½	12	10			
30	16	24	20.80	1 to 100	5	6	12	10			
24	18	24	26.43	1 to 100	4	4½	12	10			
30	18	24	26.43	1 to 100	5	6	12	10			

Longer strokes or different proportions of cylinders to order.

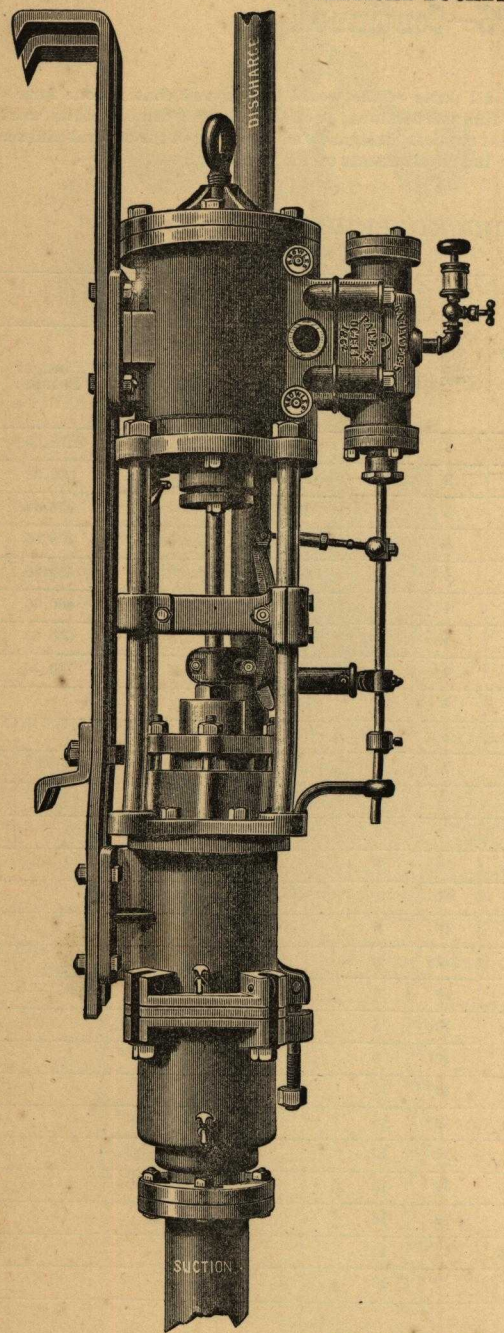
Gun Metal Pumps at prices as per any of our regular Lists, adding extra cost of composition metal.

As in some mines the water is so bad as to require Pumps made entirely of the best gun metal composition, we call attention to our various styles, as meeting such requirements at least expense. We keep many sizes in stock entirely of Gun Metal, above named.

MINING PUMPS—Continued.

IMPROVED SINKING PUMPS.

VERTICAL BUCKET-PLUNGER PATTERN.



Efficient, double-acting, quickly set, compact, easily handled and durable.

These Pumps are especially designed for use in opening new mines or in recovering old ones that have been "drowned out." Being vertical, they occupy but little room in the shaft, and will work in any position in which they are placed.

They throw a steady, continuous column of water, and work equally as well when hanging by the tackle as when hooked to the timbering of the shaft; the wrought-iron dogs for this latter purpose are made adjustable.

The water cylinders are of the "Bucket-Plunger" pattern, which design is eminently suited for gritty or bad water. They are arranged with removable pump-barrels, which can be readily replaced by new ones when worn out. Swing bolts admit of easy access to the water-valves and pump-barrels.

This is the only Sinking Pump in use that has proved, in practical operation, its ability to contend with the many difficulties incident to sinking new shafts, or recovering old mines that have been "drowned out."

Estimates furnished for larger sizes or other combinations of cylinders.

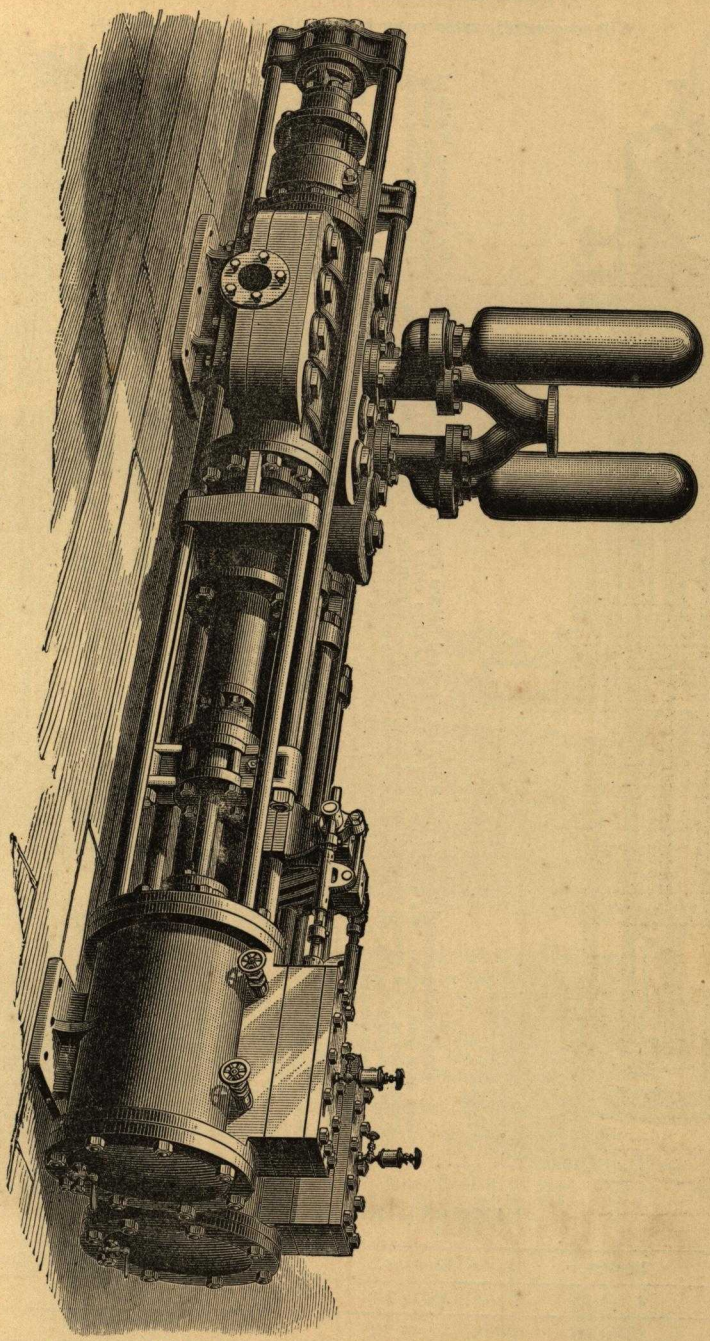
Engraving represents size: 10-inch steam cylinder, 7-inch bucket, 5-inch plunger, 10-inch stroke.

DIMENSIONS AND PRICES.

Steam Cylinder	Bucket.	Plunger	Stroke.	Galls. per Stroke.	Steam Pipe.	Exhaust Pipe.	Suction Pipe.	Delivery Pipe.	Dimensions over all.	Weight, lbs.	Price.
6	5⅜	3¾	10	0.48	¾	1	3½	2	69 x 18 x 13	800	$400
8	6⅜	4½	10	0.69	1	1¼	4	2½	72 x 22 x 15	1,000	425
10	7	5	10	0.85	1¼	1½	4	3	72 x 22 x 15	1,200	450
12	10	7	16	2.66	2	2½	6	5	114 x 29 x 22	2,800	
14	10	7	16	2.66	2	2½	6	5	114 x 29 x 22	3,000	
18	12	8½	16	3.92	3½	4	8	6			
20	14	10	24	8.16	3½	4	10	6			
22	17	12	24	11.75	4	4½	10	6			

DUPLEX PLUNGER PUMPS,

FOR HYDRAULIC CRANES, ETC.



(Engraving represents size 24-inch Steam Cylinder, 9-inch Plungers, 24-inch Stroke.)

For pumping against heavy pressures, and for driving hydraulic machinery generally, these Pumps are eminently well adapted. They have the Plungers outside connected, consequently the displacement at each stroke is exactly equal. They are built from new and improved designs, and are warranted to work without shock or jar.

These Pumps, like all the Pumps of our manufacture, are positive in their operation, and will start as soon as steam is admitted. The Plungers are made of Gun-metal Composition, Steel or Phosphor-Bronze, according to the requirements of the situation where they are to operate.

COMPOUND DUPLEX PLUNGER PUMPS,

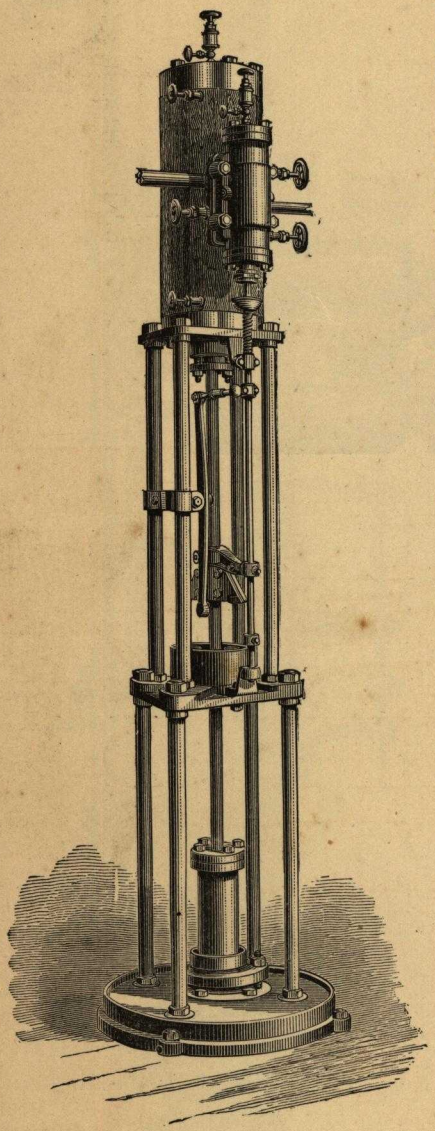
CONDENSING OR NON-CONDENSING, BUILT FROM NEW AND IMPROVED PATTERNS.

Estimates given on application.

"ARTESIAN WELL" PUMPS.

VERTICAL BUCKET-PLUNGER PATTERN.

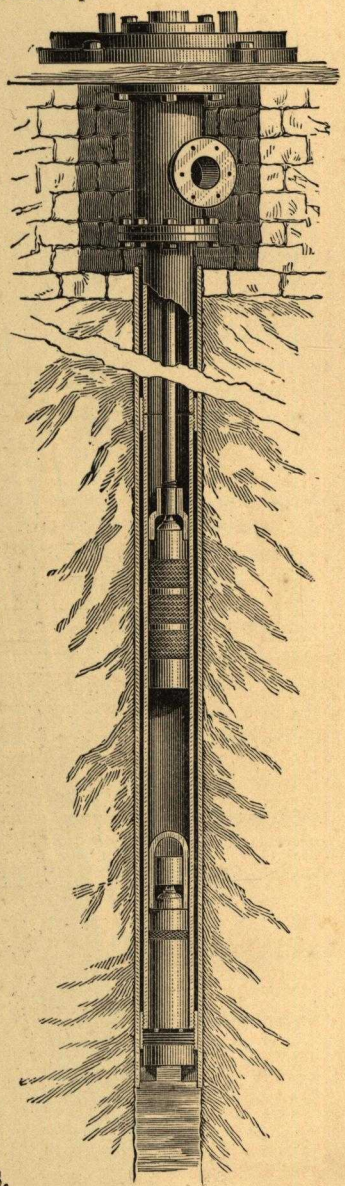
Will successfully raise water from wells 200 to 2,000 feet deep.



This is an improved form of the Knowles Vertical Steam Pump, and is designed especially for Artesian Wells of any size and depth. We were the first to introduce this class of machinery, and, after undertaking many costly experiments, and giving much time and attention in overcoming the numerous difficulties incident to pumping from wells of great depths, have succeeded in producing the only perfect Pump of the kind in use.

Compared with the more complicated and cumbersome "Working-Beam" Pumps, the Knowles Improved Direct-Acting "Artesian Well" Pumps are simpler, cheaper and more effective. They will pump from the deepest wells, and deliver a steady, continuous stream of water or oil to any part of the premises desired.

The action of the Pump is fully controlled by a perfected arrangement of the Steam Valves, making the up and down strokes equally uniform and regular. The Bucket, as shown by the engravings, is placed down the well, and discharges water on the up stroke. The upper Plunger discharges on the down stroke, thus making the flow of water uniform and the Pump virtually double-acting. The lower Pump Chamber, or working Barrel, is made of the hardest phosphor-bronze composition (not soft brass tubing), carefully finished. The Pump Bucket and Foot Valve are carefully fitted, and can be readily drawn up through the tubing for examination or repairs. The base and centre connection of the steam end form convenient drip-pans; the entire design combines elegance with greatest strength, durability and efficiency.



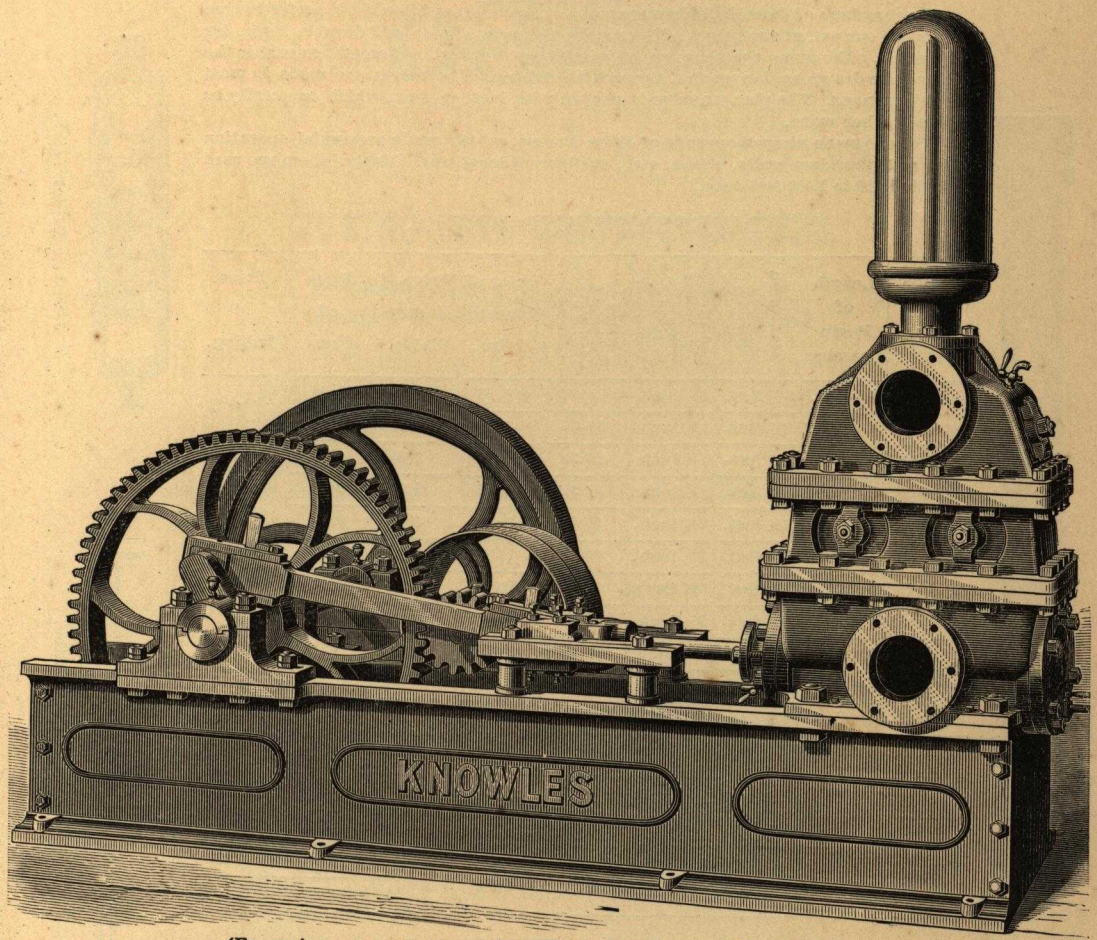
DIMENSIONS AND PRICES.

Steam Cylinder.	Bucket.	Plunger.	Stroke.	Steam Pipe	Exhaust Pipe	Price.
6	2 to 2¾	1½ to 2	7	¾	1	$275 00
6	2¾ to 3¼	2 to 2⅝	7	¾	1	285 00
6	3¼ to 4½	2⅝ to 3¼	7	¾	1	300 00
8	2 to 3	1½ to 2⅛	24	1	1¼	
8	3 to 4	2⅛ to 3	24	1	1¼	
8	4 to 5	3 to 3⅝	24	1	1¼	
10	2 to 3	1½ to 2⅛	24	1¼	1½	
10	3 to 4	2⅛ to 3	24	1¼	1½	
10	4 to 5	3 to 3⅝	24	1¼	1½	

Estimates given for larger sizes or other combinations.

POWER PUMPS.

NEW AND IMPROVED DESIGNS.



(Engraving represents size—8-inch Water Cylinder and 12-inch Stroke.)

Strong, reliable and durable. Every Pump fully tested before leaving factory.

We have lately completed an entirely new set of patterns for all sizes of Power Pumps. These Pumps are substantially constructed in every respect, and have strong, heavy Bed-Plates. They are arranged with tight and loose Pulleys, and when required have Pulleys arranged for different speeds. The Crank-Shafts, Connecting-Rods, Cross-Heads and Gears are well proportioned, and built of the best materials. Heavy Balance Wheels are provided for all sizes. The Cylinders have large water passages and Valve areas. The Lining, Piston Rod, Stuffing-Box and Valve Seats are made of the best Gun-Metal Composition. The Piston is also made of the same metal, suitably packed for hot or cold water, or other liquids. Estimates given for larger sizes.

Power Air Compressors furnished with or without air receivers. Prices given on application.

DIMENSIONS AND PRICES.

Diameter of Cylinder.	Length of Stroke.	Gallons per Revolution.	Capacity of 80 ft. Piston Speed per Minute.	Suction Pipe.	Delivery Pipe.	Price.
3¼	7	0.50	33 Gallons.	2	1½	$200 00
3¾	10	0.94	45 Gallons.	2½	2	275 00
4⅛	10	1.15	55 Gallons.	3	2½	300 00
5	10	1.70	80 Gallons.	3	2½	350 00
6	12	2.94	115 Gallons.	4	4	450 00
7	12	4.00	160 Gallons.	5	5	
8	12	5.22	208 Gallons.	5	5	
9	12	6.60	264 Gallons.	6	6	
10	12	8.16	326 Gallons.	6	6	
12	12	11.74	470 Gallons.	8	6	
14	16	21.32	640 Gallons.	10	8	
16	16	27.84	836 Gallons.	12	10	

ARTESIAN AND DEEP WELL CYLINDERS,

MADE OF HEAVY BRASS.

The chambers of these Cylinders are made of heavy brass tubes, with perfectly true bore, with our patent cup valves. They make the most simple and durable Pump for deep wells. The pump chambers are of suitable smaller inside diameter to enable the valves to be drawn up for repairs, through the tubing. The valves are made in most durable manner. The plunger valve is packed with leather cups, which can easily be replaced when worn.

We have made many thousands of these Pumps, which are in successful operation in oil and other deep wells, mines, etc., at different localities. Most of them are used in wells 1,500 to 2,000 feet deep.

Cylinder.

Jarecki's Patent Valve.

DIMENSIONS AND PRICES.

Inside Diamet'r of Pump Chamber	Length of Pump Chamber	Maximum Stroke.	Size of Pipe or Tubing required, inside Diameter.	Price of Pumps with Valves, Complete.	Price of Plunger Valve.	Price of Lower Valve.	Price of Cups.	Price of Tubing.
¾ inch.	4 feet.	3 feet.	1 inch.	$ 15 00	$ 4 50	$ 1 50	$0 08	Price will be furnished on application.
1⅛ inch.	4 feet.	3½ feet.	1¼ inch	18 00	5 50	1 90	0 08	
1⅜ inch.	5 feet.	3½ feet.	1½ inch.	25 50	6 00	2 25	0 09	
1¾ inch.	5 feet.	3¼ feet.	2 inch.	37 50	8 75	3 50	0 11	
2¼ inch.	5 feet.	3¼ feet.	2½ inch.	60 00	10 50	6 75	0 45	
2¾ inch.	5 feet.	3¼ feet.	3 inch.	75 00	12 75	9 75	0 55	
3 1-16 in.	5 feet.	3 feet.	3¼ Cas'g	90 00	16 50	13 50	0 60	
3¼ inch.	5 feet.	3½ feet.	3½ inch.	98 00	18 75	15 75	0 75	
3¾ inch.	5½ feet.	3½ feet.	4 inch.	130 00	30 00	18 00	1 15	
4¼ inch	5½ feet.	3½ feet.	4½ inch.	150 00	37 50	22 50	1 30	
4¾ inch.	5½ feet.	3½ feet.	5 inch.	180 00	53 00	27 00	1 50	
5¾ inch.	6 feet.	3¾ feet.	9 inch.	250 00	57 00	33 00	1 90	

Plunger Rod, with Tee and Coupling.

TUBING ELEVATORS.

Size	1	1¼	1½	2	2½	3	3¼	3½	4	4½	5	6
Price per set.	$9 00	12 00	12 00	15 00	16 50	18 00	18 00	18 75	18 75	19 50	19 50	21 00

TONGS FOR TUBING.

Size	1	1¼	1½	2	2½	3
Price per set, one each, for Tubing and Coupling.	$2 25	3 00	3 75	6 00	7 25	8 25

Size	3¼	3½	4	4½	5	6
Price per set, one each, for Tubing and Coupling.	$8 25	9 75	11 00	12 75	13 00	15 00

SUCKER RODS.

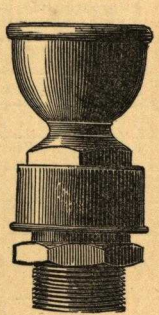
Wooden Rods (best Oak or Hickory), with Iron Connections, per foot	10 cts.
Wooden Rods for large Pumps, with heavy Iron Connections, per foot	25 cts.
Iron Rods for 1¼ and 1½ Tubing, per foot	09 cts.

PLUNGER RODS.

12 feet long, 1⅛ inch diameter, each	$6 00
Adjusters for same, each	12 00

Lower Valve.

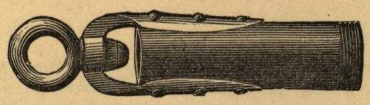
BRASS STUFFING BOXES FOR PLUNGERS.



Stuffing Box.

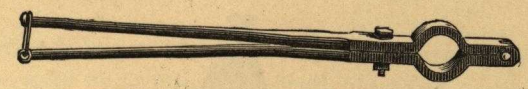
Size	1	1¼	1½	2	2½	3	3¼	4	4½	5	6
Price	$2 50	3 00	3 00	3 75	5 25	6 00	6 00	7 50	7 50	8 25	9 00

TUBING AND CASTING SWIVELS.



Size.....	¾	1	2	3	3¼	3½	3¾	4	4¼	4¾	5	5 3-16	5⅝	6¼
Price...	$4 50	4 50	5 50	6 75	6 75	7 25	7 50	8 00	9 00	12 00	15 00	16 25	16 25	24 00

TUBING AND CASTING CLAMPS.



Size....	¾	1	2	3	3¼	3½	3¾	4	4¼	4¾	5	5 3-16	5⅝	6¼
Price....	$4 50	4 50	6 00	9 00	9 00	9 75	10 50	11 25	12 00	14 25	15 00	15 75	15 75	24 00

MACHINERY FOR DRILLING ARTESIAN WELLS.

JARECKI STEAM ENGINE,

With Balance Valve and reverse motion. Size of Cylinder, 9½ x 13.

Price, complete	$350 00

RIG IRONS.

Complete Sets	$125 00

Complete Sets, consisting of 1 Shaft, 1 Crank, 1 Collar, 1 Wrist Pin, 2 pair Flanges, 4 Keys, 2 Boxes, 1 Saddle, 2 Side Irons, 1 Sand Pump Pulley, 1 Derrick Pulley, 1 Stirrup, 1 Walking Beam Hook, 2 Gudgeons with Bands.

RIG IRON OUTFITS.

	Price.
No. 1 consists of 1 Set Rig Irons	$150 00
1 Wooden Sand Reel	
1 Brake Lever	
1 Brake Band and Staple	
2½ Kegs Nails	
6 Extra Bolts	
1 Back Brake	
No. 2, same as above, with Iron Reel, price	$147 00

SAND PUMPS.

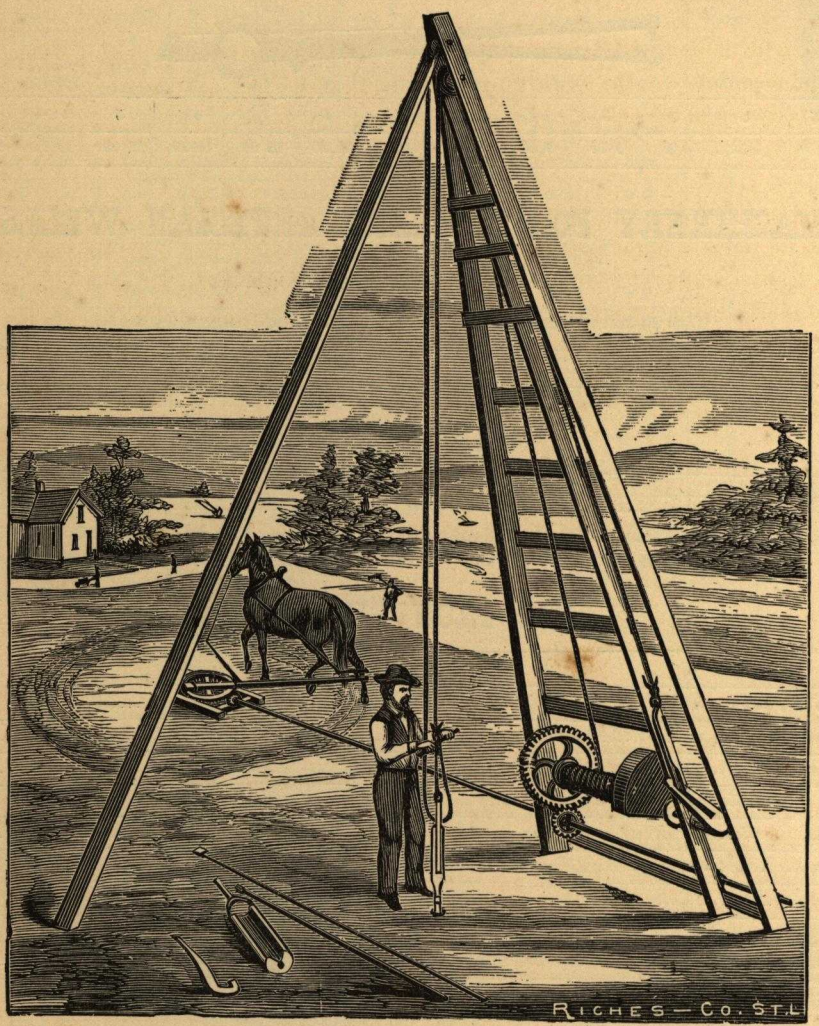
Size.	Price.
2 and 2½, Morahan	$24 00
2¾	25 50
3	27 00
3¼	30 00
3½	36 00
3¾	36 00
4	42 00
4½, 4¼ and 4¾	44 00
5	45 00
5 3-16	47 00
5⅝	48 00
2 and 2½, Combination	24 00

Size.	Price.
2¾	$29 00
3	30 00
3¼	33 00
3½	36 00
3¾	42 00
4	45 00
4½, 4¼ and 4¾	48 00
5	50 00
5 3-16	53 00
5⅝	56 00
Bailers, 4 inch, per feet	1 50

L. M. RUMSEY MFG. CO.'S EARTH BORING AND ROCK DRILLING MACHINE, COMBINED.

(Helm's Patent.)

Fig. 3.



The same kind of an iron pump that you would use in a large well can be used successfully in this kind. Heretofore it has been necessary for those who followed the business of putting down wells, to either dig and wall the well down to the rock, or else have a separate Well Auger Outfit for boring the earth before the drill could be started in the rock. But we have a machine that supplies this want.

PRICES OF L. M. RUMSEY MFG. CO.'S CHALLENGE WELL AUGER.

(Helm's Patent.)

COMBINED WELL BORING AND ROCK DRILLING MACHINE,

All complete, with 12-inch well auger and all the necessary articles for boring 60 feet of earth, and a complete outfit for drilling to the depth of 100 feet, all ready to go to work, except woodwork of derrick	$540 00

Consisting of 1 drill bar and jar, 1 drill bit 4 to 6 inches, 2 drill wrenches, 2 boring levers, 1 crooked lever for horse, 1 horse power tumbling shaft and 2 couplings, 1 drilling swivel clutch, 1 swivel hook, 2 shive pulleys, 2 $\frac{7}{8}$-inch bolts 12 and 14 inches, 2 hand cranks, spur wheel and pinion, 2 shafts, 1 windlass drum, 1 heavy balance weight, 1 crank, 1 crank clutch, 5 pairs boxes, 10 $\frac{1}{2}$x8-inch bolts, 2 $\frac{5}{8}$-inch bolts, 1 earth auger, 1 reaming knife, 60 feet $1\frac{3}{8}$-inch shafting with patent self-couplers attached, 120 feet $1\frac{1}{8}$-inch hawser-laid drill rope, 120 feet $\frac{3}{4}$-inch sand pump line, 80 feet guy lines, 45 feet 1-inch rope, 6 feet chain, 1 4-inch sand pump, 1 7-inch sand pump.

ONE-HORSE ROCK DRILLING OUTFIT,

Without earth auger tools	$375 00

Consisting of 1 drill bar and jar, 1 drill bit, 2 heavy drill wrenches, 1 sand pump, 1 horse power complete with tumbling shaft and couplings, 1 swivel rope clutch, 2 shive pulleys, 2 $\frac{7}{8}$-inch bolts 12 and 14 inches long, 2 cranks, 1 spur wheel and pinion and shafts for the same, 1 windlass drum, 1 heavy balance weight, 1 tight and loose crank, 1 crank clutch, 1 pitman, 5 pairs boxes, 10 $\frac{1}{2}$x8-inch bolts, 120 feet $1\frac{1}{8}$-inch hawser laid rope, 120 feet $\frac{3}{4}$-inch sand pump line, 80 feet $\frac{1}{2}$-inch rope, 40 feet 1-inch rope, 6 feet chain.

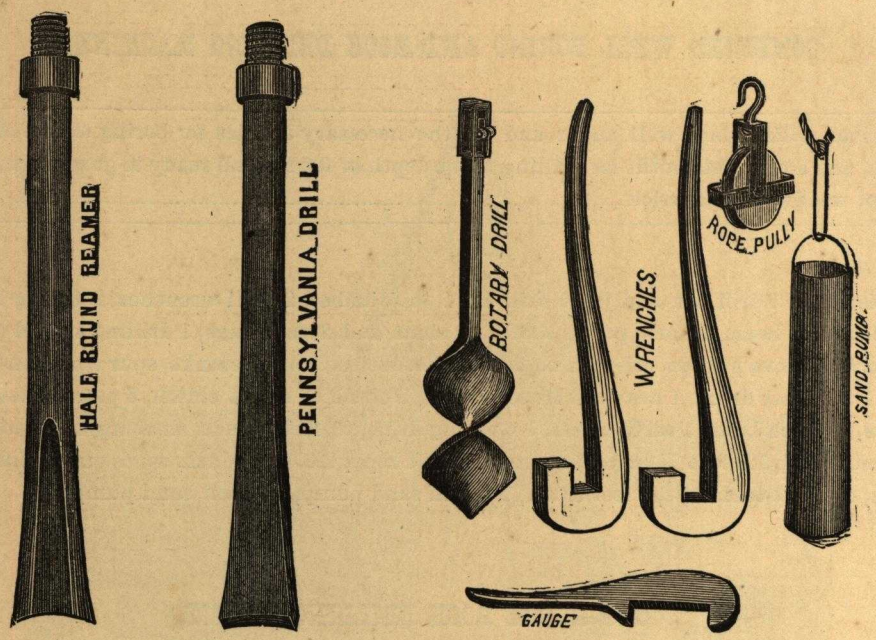
The above outfit is intended to drill 120 feet, but it will do good work to the depth of 200 feet by using more rope.

Two-horse power machine, to bore 300 to 400 feet	$490 00
Four-horse power machine, to bore 500 to 600 feet	600 00
Six-horse power machine, to bore 700 to 800 feet	660 00

For the two, four and six-horse power machines, the powers, drills, ropes and all the machinery are heavy in proportion.

L. M. RUMSEY MFG. CO.'S CHALLENGE ROCK DRILLING TOOLS.

Fig. 2.



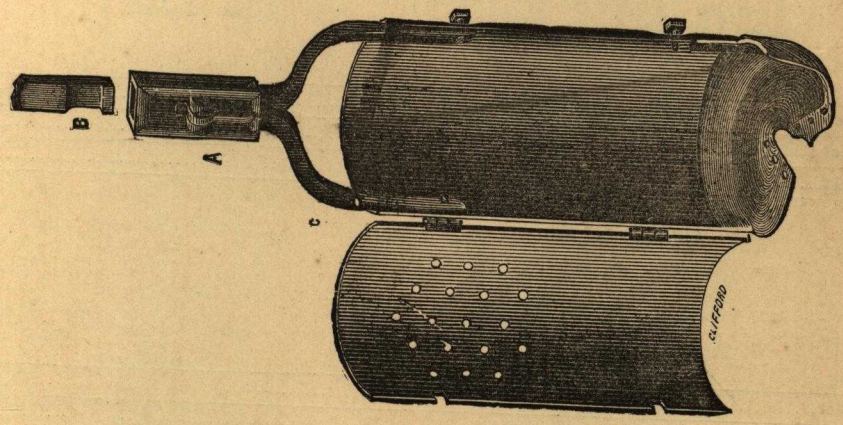
4-inch Pennsylvania Bit, complete	$36 00
6-inch Pennsylvania Bit, complete	45 00
8-inch Pennsylvania Bit, complete	60 00
4-inch Z Bit, complete	53 00
6-inch Z Bit, complete	60 00
8-inch Z Bit, complete	68 00
4-inch Reamer	45 00
6-inch Reamer	53 00
8-inch Reamer	75 00
Sand Pump	10 50
Wrenches, per pair, for horse-power rigs	23 00
1 Drill Bar, 3 inches diameter, including Jars and Box	68 00
Rope Pulleys	5 25

These prices are for tools to be used with horse-power.

We can furnish a first-class Pennsylvania Drilling Outfit, to go 1,000 feet in depth, including Boiler and Patent Link Reversible 15-horse power Engine, best steel lined Jars, and $1\frac{3}{4}$-inch Hawser Laid Drill Rope, all complete.

Can furnish cheaper outfit, to go same depth. Write for prices.

L. M. RUMSEY MFG. CO.'S CHALLENGE WELL AUGERS.



6 inches in diameter	$27 00
8 or 9 inches in diameter	37 00
11 or 12 inches in diameter	45 00
15 inches in diameter	53 00
18 inches in diameter	60 00
20 inches in diameter	68 00
Shafting, per foot, 1⅝ inches square	0 70
Shafting, per foot, 1½ inches square	0 75
Patent Self-Couplings, each	3 00
Boring Levers, each	4 50
Heavy Lever, for horse-power	9 00
Sand Pumps, each	9 75
Tube Lifter, each	13 00
Well Bucket, 6 inches in diameter, valve in bottom	3 00

A full outfit for boring earth 60 feet in depth, consisting of 1 Challenge Auger with Reamer, 60 feet of 1⅝-inch shafting with self-couplers fitted on, 1 sand pump, 1 swivel hook for large rope, 1 wheel and pinion to run auger rope over, 4 sets iron boxes for derrick gearing, 1 spur wheel and pinion, 2 windlass axles, 2 cranks, 1 windlass drum, 1 brake, 2 boring levers for hand-power and 1 for horse-power, 45 feet 1-inch rope for auger, 80 feet ⅝-inch rope for guys, 75 feet of rope for sand-pump, 8 bolts, 1 pulley wheel, 1 inch bolt 12 inches long—in short, everything needed to bore a well except woodwork for derrick, which a man can make in one day.

WE FURNISH FOR THE FOLLOWING PRICES:

No. 1 Outfit, 11 or 12-inch Auger, all complete	$190 00
No. 1 Outfit, 15-inch Auger, all complete	195 00
No. 1 Outfit, 18-inch Auger, all complete	210 00
No. 1 Outfit, 20-inch Auger, all complete	220 00
Woodwork of Derrick, combined rig	23 00
Woodwork of Well Auger Derrick	19 50

PRICE LIST OF ARTESIAN WELL TOOLS.

SINKER BAR.

3 inch, 12 feet	$56 00
3¼ inch, 12 feet	60 00
3½ inch, 12 feet	68 00

AUGER STEM.

3 inch, 20 feet	$79 00
3¼ inch, 20 feet	90 00
3½ inch, 20 feet	98 00

BITS—CLUB OR FLAT.

4 inch, 25 lbs. Steel	$34 00
5 inch, 60 lbs. Steel	56 00
5⅝ inch, 60 lbs. Steel	60 00
6 inch, 70 lbs. Steel	68 00
8 inch, 80 lbs. Steel	75 00

Re-steeling Bits, 45 cts. per lb. for each lb. of Steel used.

ROUND REAMERS.

4 inch, 25 lbs. Steel	$37 00
5 inch, 60 lbs. Steel	45 00
6 inch, 70 lbs. Steel	53 00
7 and 8 inch, 80 lbs. Steel	75 00

STEEL LINED JARS, WITH BOX AND PIN.

4 inch	$135 00
5 inch	150 00
For Big Hole	210 00

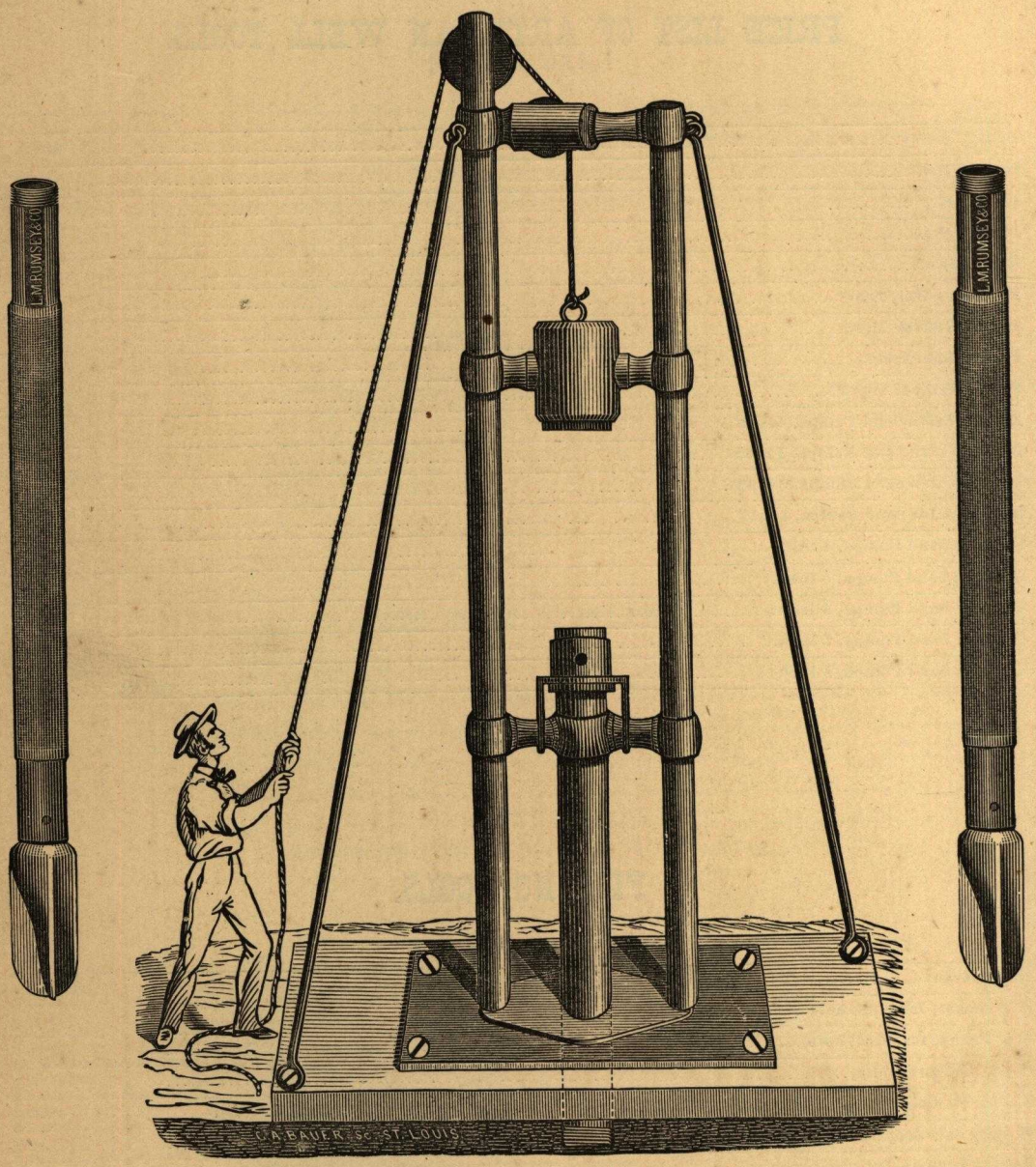
PRICE LIST OF ARTESIAN WELL TOOLS.

Boxes, heavy	$25 00
Boxes, light	15 00
Pins, heavy	14 00
Pins, light	10 50
Rope Knife	15 00
Boring Swivel, heavy	27 00
Boring Swivel, light	21 00
Patent Rope Socket	30 00
Patent Temper Screw	75 00
Double Valve Sand Pumps, 4 inch	45 00
Double Valve Sand Pumps, 5 inch	53 00
Double Valve Sand Pumps, 6 inch	60 00
Double Valve Sand Pumps, 8 inch	68 00
Common Sand Pumps, 4 inch	16 50
Common Sand Pumps, 5 inch	20 00
Common Sand Pumps, 6 inch	24 00
Common Sand Pumps, 7 inch	27 00
Common Sand Pumps, 8 inch	30 00

FISHING TOOLS.

Horn Socket	$ 53 00
Slip Socket, for large hole	168 00
Slip Socket, for small hole	127 00
Grabs, for large hole	105 00
Grabs, for small hole	68 00
Winged Substitute, 8 inch	135 00
Hollow Reamer, for small hole	120 00
Hollow Reamer, for large hole	225 00
Bull Dog Socket, for large hole	90 00
Bull Dog Socket, for small hole	75 00

L. M. RUMSEY MANUFACTURING CO.'S PATENT PIPE DRIVER.

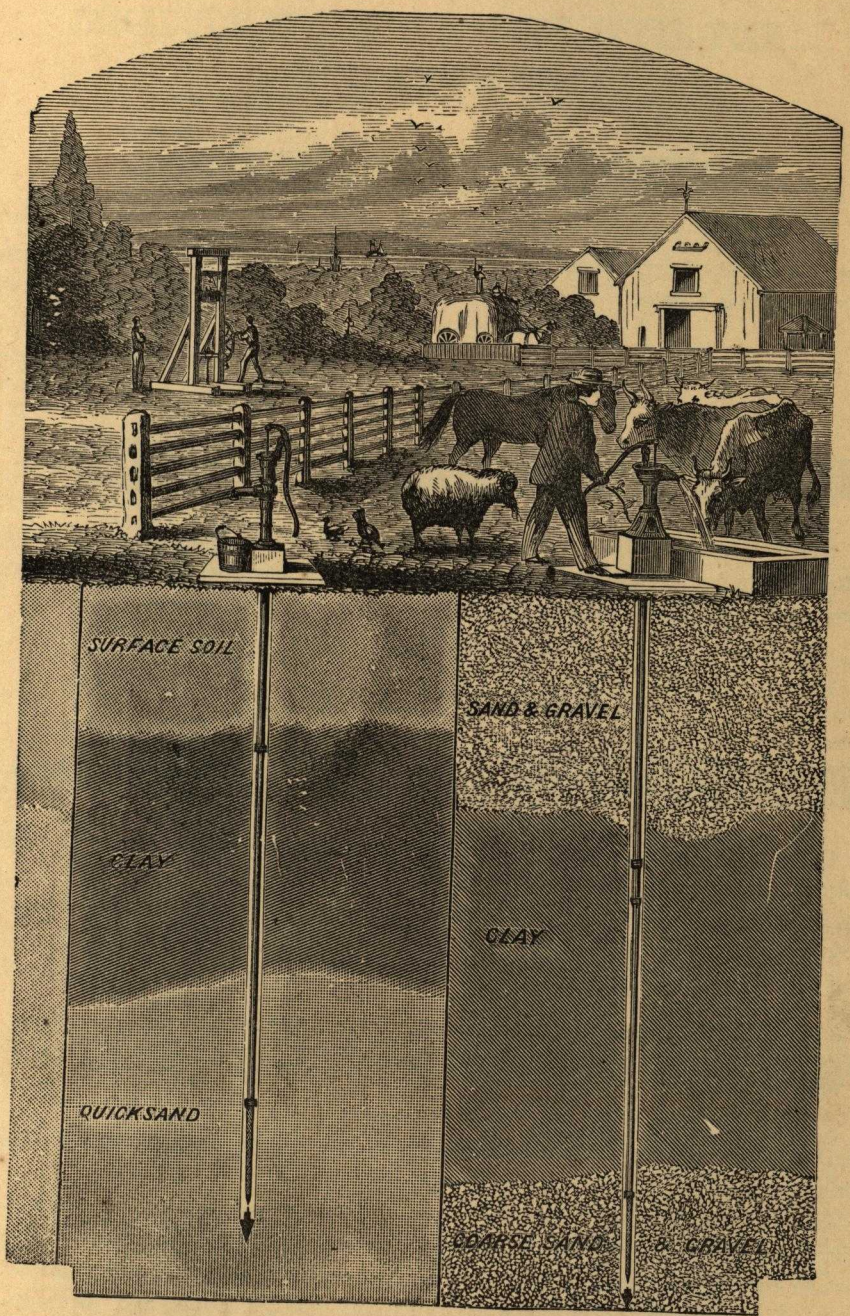


Annexed is a cut of our Patent Pipe Driver. This is a machine that patent Well men have long stood in need of. Some of its advantages are as follows: It will drive more pipe in an hour than a man can drive with a maul in a day; it holds the pipe firmly in its place, and guides it while it is being driven down. As it is impossible for the pipe to get out of a direct line with the Driver, and as the Drop always hits a perfectly square and direct blow, it neither breaks the pipe nor bursts the sockets, saving an immense amount of labor and expense. It is so light and portable that it can be carried about in a light wagon and set up in five minutes. Whole weight, 125 lbs.

Price, with the right to use.....	$30 00

All orders accompanied with the money will receive prompt attention.

SECTIONAL VIEW OF THE DRIVEN WELL.



This illustration shows a sectional view of the Driven Well in the ground. It is always best to get, if possible, the well point into gravel or coarse sand. Where nothing but quicksand is found, No. 80 or 90 gauze should be used on the points. Where it is necessary to go through clay or loam before reaching sand or gravel bearing water, would advise that one of our clay augers be used to bore through the clay to prevent cementing up the point by driving through the clay.

TUBE WELL POINTS.

FIGURE A, WELL POINT.

This Point is made of perforated Gas Pipe, covered with Brass Wire-Cloth protected by a strong perforated Brass Shield.

FIGURE B, WELL POINT.

This is the well-known Washer Point, the Brass Wire-Cloth being put into counter sunk holes and fastened in by a washer, placing the gauze below the surface, so that it will not be injured when driven into the ground.

FIGURE C, WELL POINT.

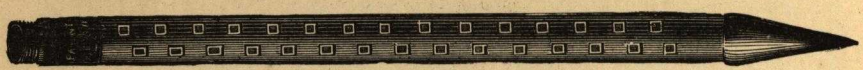


Figure C is what is known as the Patch Point, and is made by soldering the gauze over the perforations.

FIGURE D, WELL POINT.

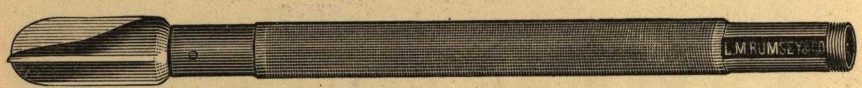


Figure D is the well-known Rumsey Centrifugal Well Point, and can be constructed with perforations covered in any of the above illustrated manners.

N. B.—The patents covering all of the above manners of construction are owned by L. M. RUMSEY, Trustee, and re-issued Patent No. 6,337, covering the use of a screen or strainer of Wire Gauze in combination with a Well Tube, has been declared good and valid in law by a decision of the U. S. Courts in Indianapolis, Cincinnati and St. Louis, and injunctions issued against infringing parties.

Any person or persons manufacturing, selling or using any of the above Well Points not made under license from the said L. M. RUMSEY, Trustee, will be prosecuted to the full extent of the law.

L. M. RUMSEY, TRUSTEE.

SCHEDULE PRICES FOR TUBE WELL POINTS.

(Adopted November 13th, 1878. In effect from December 13th, 1878.)

No. 50 GAUZE BEING THE STANDARD.

Diameter.	Length.	No. of Holes and Price.	No. of Holes and Price.	No. of Holes and Price.	No. of Holes and Price.	No. of Holes and Price.	Extra for Gauze Nos. and Net Prices.		
1¼	20-inch.	$2 50 20	$3 00 40	$3 25 50	$3 50 60	....	30c. 60	40c. 80	60c. 90
1¼	24-inch.	4 00 80	4 50 100	5 00 120	....	....	30 60	40 80	60 90
1¼	30-inch.	5 00 80	5 50 100	6 00 120	6 50 140	....	40 60	55 80	80 90
1¼	36-inch.	6 00 100	6 50 120	7 00 140	7 50 160	....	50 60	70 80	1 00 90
1¼	42-inch.	7 00 120	7 50 140	8 00 160	8 50 180	....	60 60	80 80	1 20 90
1¼	48-inch.	7 50 120	8 00 140	8 50 160	9 00 180	9 50 200	70 60	95 80	1 40 90
1½	24-inch.	6 00 80	6 75 100	7 50 120	....	....	35 60	45 80	70 90
1½	30-inch.	7 50 80	8 85 100	9 00 120	9 75 140	....	45 60	70 80	95 90
1½	36-inch.	9 00 100	9 75 120	10 50 140	10 75 160	....	60 60	80 80	1 15 90
1½	42-inch.	10 50 120	10 75 140	12 00 160	12 75 180	....	70 60	95 80	1 40 90
1½	48-inch.	11 25 120	12 00 140	12 75 160	13 50 180	14 25 200	80 60	1 10 80	1 60 90

Diameter.	Length.	No. of Holes and Price.	No. of Holes and Price.	No. of Holes and Price.	Diameter.	Length.	No. of Holes and Price.	No. of Holes and Price.	No. of Holes and Price.
2	30-inch.	$12 00 200	$14 00 250	$16 00 300	3	36-inch.	$25 00 350	$27 50 400	$30 00 450
2	36-inch.	15 50 250	17 00 300	19 00 350	3	48-inch.	30 00 400	32 50 450	35 00 500
2	48-inch.	20 00 300	22 00 350	24 00 400	3	60-inch.	35 00 450	37 50 500	42 00 600
2½	36-inch.	20 00 300	22 00 350	24 00 400	4	48-inch.	40 00 500	45 00 600	....
2½	48-inch.	24 00 350	26 00 400	28 00 450	4	60-inch.	45 00 500	50 00 600	55 00 700
2½	60-inch.	28 00 400	30 00 450	32 00 500	4	72-inch.	50 00 600	55 00 700	60 00 800

The above prices include all the sizes and styles made. See preceding page.
Tube Well Points will be sold to the trade at the above List.

HOW TO SINK DRIVE WELLS.

After first obtaining the necessary tools, screw the Pipe firmly into the Point, screw the Drive Head on the upper end of the pipe, then drive down until it is necessary to attach another piece, when you remove the Drive Head and screw on firmly another piece of pipe, continuing the same process until a sufficient depth is obtained, when you can attach your sand pump to the test well. To find when you have water, drop a little inside the pipe. In starting the water, it is often an advantage to fill the pipe full of water before attaching the sand pump.

These wells can be sunk to any depth when it is not necessary to go through rock. When the water does not rise within 25 feet of the surface, it is necessary to put the working cylinder down within 20 or 25 feet of the lowest point to which the water will recede; in such cases our Anti-Freezing Pumps should be used.

Parties wishing to put down wells, will need the following tools: Two pairs of Pipe Tongs, one Patent Pipe Driver, one Driving Socket, one Pitcher Spout or Sand Pump, and a Clay and Sand Auger.

PATENT IMPROVED CLAY AND SAND AUGERS,

FOR BORING WELLS.

CLAY AUGERS.

2½ inch, to couple on 1¼ inch pipe	$ 6 00
3 inch, to couple on 1¼ inch pipe	6 75
4 inch, to couple on 1½ inch pipe	10 50
6 inch, to couple on 1½ to 2 inch pipe	25 00

SAND AUGERS.

2½ inch, to couple on 1¼ inch pipe	$ 7 50
3 inch, to couple on 1¼ inch pipe	8 50
4 inch, to couple on 1½ inch pipe	13 25
6 inch, to couple on 1½ inch to 2 inch pipe	30 00

We make also a Sand and Clay Auger combined, which we list at same size and price as Sand Augers.

About as many wells are put down nowadays by boring first as by driving, and no Auger seems to meet with so many expressions of favor as those we make. They will bore through stiff clay soil or quicksand by using the one adapted to the kind of work in hand. We claim the following advantages for our Augers:

1st. The Auger is so constructed that it forms a coil around the dirt and holds it firmly while being drawn to the surface.

2d. It always draws easy, as it forms a hole larger than the Auger, which allows the air and water to pass around the outside.

3d. It having a cutting edge the whole length, consequently the strain and wear is the same from shank to point.

4th. It will take out a stone nearly as large as the hole, if the lip passes below it.

5th. It is easily sharpened by filing it beveling from the inside. They are made from the best cast steel, and are durable.

6th. The shanks are common gas pipe, and by using pipe for rods the same rods will make the well. When water is reached take off the Auger and put on a point, and it is ready to let back in the water strata.

DIRECTIONS FOR USING AUGERS.

Before starting see that the Auger stands straight with the rods. Always keep water in the hole when boring clay, as it will not work and fill the Auger if the clay be dry. In boring sand use just enough water to keep it moist; pour it inside the pipe so it will not wash the hole. Turn the Auger several times after it is full; it will pack it in the coil and not be as liable to lose out.

We challenge any one to produce an Auger which for all kinds of soil will work as well as ours.

MALLEABLE IRON DRIVING CAPS.

For receiving blows from wood maul, or block, when struck with iron sledge, for driving Wells. A new and unequaled pattern.

Fitted for standard size tubing, 1¼ inch	$ 75
Fitted for standard size tubing, 1½ inch	90
Fitted for standard size tubing, 2 inch	1 50

STEEL DRIVING CAP, OR HEAD.

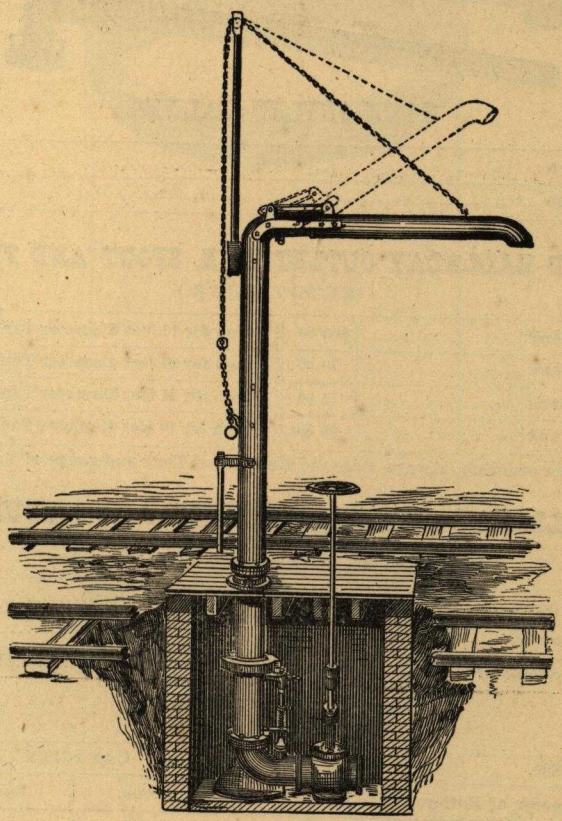
For 1¼ inch pipe, each	$ 3 00
For 1½ inch pipe, each	4 50
Iron Maul, with hard wood faces, each	2 50
Cutting pipe in driving lengths and threading same, for each cut and thread	0 10

We make it a specialty to furnish Drive Well Men with Pumps, Pipe and Tools, for sinking Drive Wells.

THE DODGE RAILROAD STAND PIPE,

FOR CONVEYING WATER INTO LOCOMOTIVE TANKS. ANTI-FREEZING. NO LEAKY JOINTS.

(Patented December 22d, 1874; July 4th, 1876.)

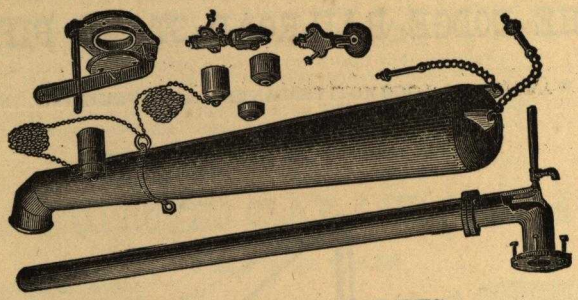


This Pipe is designed and constructed for double track purposes, and is so arranged that it can be changed from one track to the other with the greatest facility and ease, and can be used with equal advantage for one track only. The water gate and rotating parts are under ground at such a depth as to be absolutely frost proof, and being thoroughly drained when not in use cannot be frozen. The water gate valve is of brass with brass seat, and is operated by a hand-wheel, three turns opening it to the full capacity of the Pipe, making it practically a quick opening valve.

The Patent Flexible Rubber Joint at the connection of the Drop Pipe and the Upright Pipe is water-tight, and so supported by hinges and lugs that there is no strain upon the rubber, while the joint is perfectly flexible, with a side or lateral motion, and allows the Drop Pipe to be elevated to any desirable height by a chain running over a pulley at the top of the standard.

The Upright Pipe is very easily rotated by a jointed lever, which may also be used to lock the Main Pipe to the Water Gate Stem, so that the Pipe cannot be rotated or the water let on by mischievous persons. The Patent Drain Valve in the Elbow at the bottom of the Pipe is operated by a Cam on the disk passing over the elastic stem; when the Pipe is turned over the Tender this Drain Valve is closed, preventing loss of water while filling the Tank; turning the Pipe back from the Tender opens the Valve and the water runs from the upper part of the Pipe, doing away with all liability of freezing. In warm climate or in summer this valve can be closed by a set screw, preventing wastage of water entirely. This Pipe can be operated in less than two feet of space for double track purposes. Write for prices.

TANKS, VALVES, Etc.



TANK OUTLET VALVES.

Halladay Outlet Valve, 6 inch	$12 00
Halladay Outlet Valve, 7 inch	15 00

IMPROVED HALLADAY OUTLET PIPE, SPOUT AND FIXTURES.

(EXCEPT VALVE.)

6 inch for 16 feet diameter Tank	$65 00	7 inch for 16 feet diameter Tank	$75 00
6 inch for 20 feet diameter Tank	70 00	7 inch for 20 feet diameter Tank	80 00
6 inch for 24 feet diameter Tank	75 00	7 inch for 24 feet diameter Tank	85 00
6 inch for 30 feet diameter Tank	82 50	7 inch for 30 feet diameter Tank	92 50

When ordering, always state the diameter of Tank and gauge of Track.

HALLADAY OUTLET PIPE, SPOUT AND FIXTURES.

(EXCEPT VALVE.)

(Old Pattern as manufactured by us for ten years.)

6 inch Pipe, Spout and Fixtures	$55 00
7 inch Pipe, Spout and Fixtures	68 00

Our Spouts or "Drop Pipes" are made of the best heavy galvanized iron.

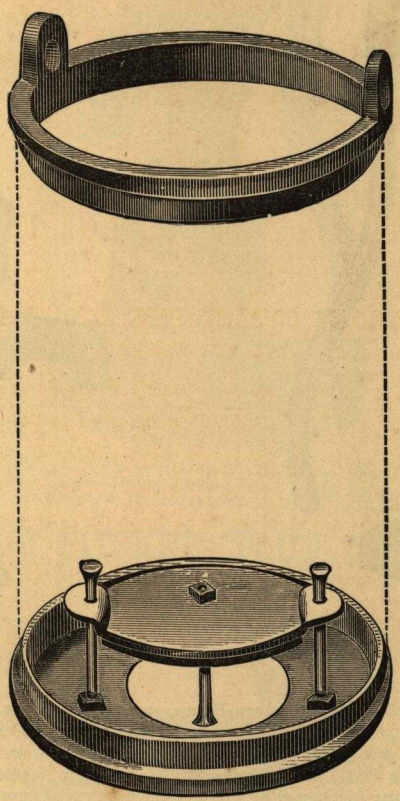
RAILROAD TANKS.

SIZE OF TANK.		Number of Hoops.	CAPACITY.		Price.
Length of Stave.	Diameter of Bottom.		Gallons.	Barrels.	
12 feet.	12 feet.	9	9,500	301	$135 00
10 feet.	16 feet.	8	14,000	444	165 00
12 feet.	16 feet.	9	17,000	540	185 00
14 feet.	16 feet.	10	19,300	612	200 00
16 feet.	16 feet.	11	23,066	764	215 00
14 feet.	18 feet.	10	25,300	800	255 00
16 feet.	18 feet.	11	28,500	904	280 00
14 feet.	20 feet.	10	31,300	993	300 00
16 feet.	20 feet.	11	36,000	1,143	325 00
16 feet.	22 feet.	12	43,500	1,381	375 00
16 feet.	24 feet.	12	51,800	1 644	420 00
18 feet.	24 feet.	14	58,600	1,892	460 00
16 feet.	30 feet.	14	81,000	2,571	625 00
18 feet.	30 feet.	15	93,000	2,952	675 00

The above prices include nothing but the Staves, Bottom, Dowel-Pins and Iron Hoops, on board cars at factory. We set up every Tank and mark each piece and every Hoop. Scale drawings showing foundation, support and method of frost proofing will be furnished all purchasers, free of charge. All our Tanks are built of Michigan pine, free from sap, shakes and unsound knots, and guaranteed not to leak, if properly set up. We will quote prices on Tanks made of clear pine, when desired.

ZIMMERER'S PATENT WELL BUCKET,

ADAPTED ESPECIALLY FOR BORED WELLS AND CISTERNS, DUG WELLS AND ELEVATING LIQUID.



(Patented April 15, 1879.)

This truly celebrated Well Bucket is supplying a want long felt.

It is the only ALL METAL BUCKET in the market, and will last five times as long as the old style wooden bottom.

We make six sizes—4, 4½, 5, 5½, 6 and 7 inch.

In order to save freight, we will sell to the trade the cast metal top and bottoms, with privilege to make the bucket.

Size, inches	4	4½	5	5½	6	7
Price, per doz. Tops and Bottoms, as per cut	$4 00	4 50	5 00	5 50	6 00	7 00

Manufactured only by L. M. RUMSEY MANUFACTURING CO.,

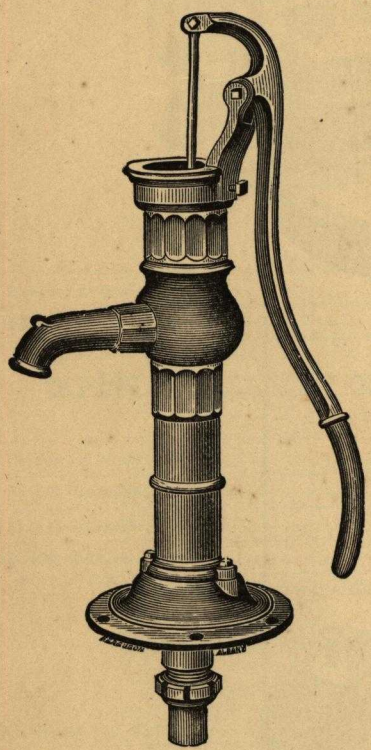
806 to 820 North Second Street, St. Louis, Mo.

IRON CISTERN PUMP,

WITH BRASS VALVE SEAT, UNION COUPLING, BOLTED BASE AND REVOLVING FULCRUM.

(Patented October 10, 1865.)

Fig. 101.



NEW STYLE, REVOLVING FULCRUM CISTERN PUMP,

WITH BRACKETS AND BRASS VALVE SEAT.

Fig. 102.

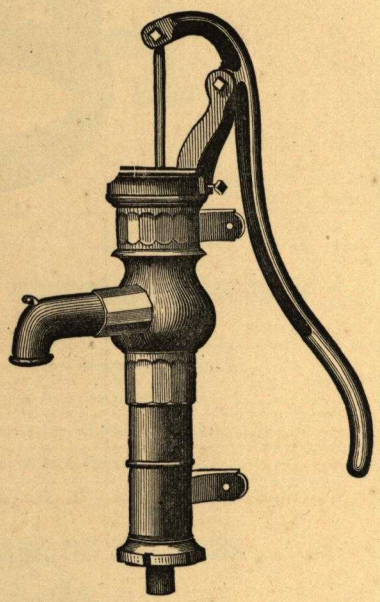


Fig. 101 accurately represents our New Style Cistern Pump, as now built by us. It has a strongly bolted base, with "Union" coupling attachment below, fitted with connections to the brass valve seat for the standard gauge of the iron pipe of the market. Accompanying each Pump is also a brass tube, made to pass through the coupling-nut and arranged for soldering lead pipe, the Pump being thus adapted to either description of pipe. There is an adequate reservoir above the spout to retain any surplusage of water caused by rapid pumping, thus preventing the possibility of overflow. The cylinder is bored uniformly round and straight, and afterwards smoothly polished throughout, causing the Pump to work with the utmost ease and efficiency. The fulcrum and lever revolve to any point most convenient for use by simply loosening the set-screw shown under the lever, and by the same process the plunger can be withdrawn from the cylinder.

Fig. 102 fully illustrates our New Style of Bracket Cistern Pump. The particular use will be readily seen, as it is specially adapted to places where a Pump with a flanged base could not be used. It can be secured to the wall or a post, as found most convenient, and take up the least possible space. In construction it combines all the meritorious features of our Fig. 101, having the revolving top, brass valve seat, bolt fastenings and union couplings. To prevent freezing the lever is raised to its full height, which trips the valves and lets the water all out of the Pump. This simple act will render all our Pumps of this style anti-freezing.

The sizes, capacity and prices correspond precisely with those of Fig. 101. We make five sizes of iron and brass, fitted for either iron or lead pipe connections.

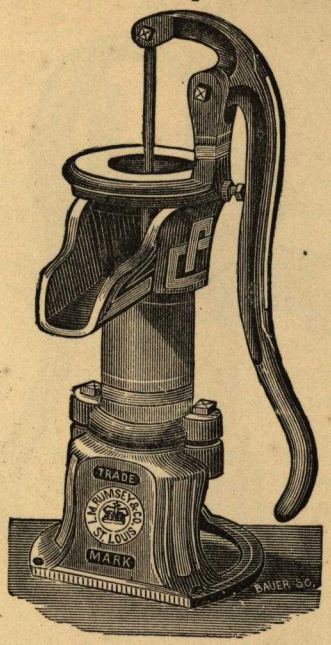
SIZES, CAPACITY AND PRICES. (Figs. 101 and 102.)

	Iron.	Brass Cyl.
No. 0, 2 inch caliber, capacity per stroke 0.03 gallon, 1 inch pipe	$3 50	$5 50
No. 1, 2¼ inch caliber, capacity per stroke 0.04 gallon, 1 inch pipe	4 00	6 00
No. 2, 2⅜ inch caliber, capacity per stroke 0.05 gallon, 1 or 1¼ inch pipe	4 50	7 00
No. 3, 2½ inch caliber, capacity per stroke 0.05 gallon, 1¼ inch pipe	5 00	8 00
No. 4, 3 inch caliber, capacity per stroke 0.07 gallon, 1¼ or 1½ inch pipe	5 50	10 00

Always fitted for above-named sizes of connecting pipe, unless ordered otherwise.
When ordering, state whether fitted for iron or lead pipe.

GOLDEN CROWN PITCHER PUMP.

Fig. 90. Close-top Pitcher Pump.



We have at last perfected the Pitcher Pump by giving it a tight top, thus effectually preventing water from flying out by rapid pumping. It also has the Patent Brass Raised Sand Valve Seat, which prevents the pump from leaking its priming, thus making it, as now constructed, the most perfect pump in the market.

NEW STYLE PITCHER-SPOUT CISTERN PUMP.

Fig. 99.

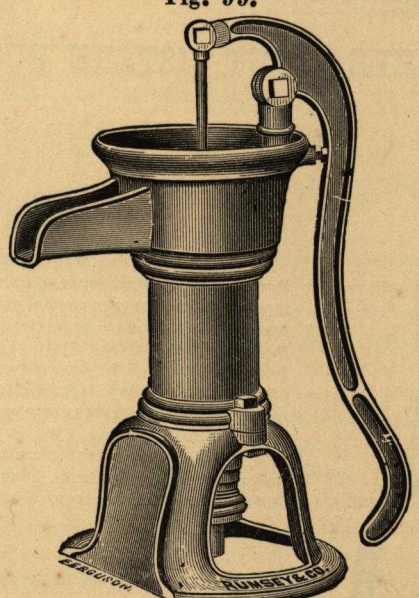


Fig. 99 illustrates our New Style Pitcher-Spout Cistern Pump, with open-top fulcrum or bearer, forming a complete circle around the top of the stock. The lever can be changed or revolved to any desired position, for right or left-handed use, by simply loosening the set-screws. This Pump is fitted with suitable coupling for either lead or iron pipe. In its construction nothing is omitted which can add to its efficiency or durability. The cylinder is bored and polished smoothly as glass, while every part is made strong and of unexcelled workmanship. All of our Pumps have brass valve-seats, and are made anti-freezing. Each and every part can be instantly duplicated, as our patterns, being made of iron, always exactly repeat themselves. We make five sizes, fitted for lead or iron pipe connections.

SIZES, CAPACITY AND PRICES. (Figs. 90 and 99.)

No. 1, 2¼ inch caliber, capacity per stroke 0.05 gallon, 1 or 1¼ inch pipe	$4 25
No. 2, 3 inch caliber, capacity per stroke 0.07 gallon, 1¼ or 1½ inch pipe	4 75
No. 3, 3½ inch caliber, capacity per stroke 0.10 gallon, 1¼ or 1½ inch pipe	5 25
No. 4, 4 inch caliber, capacity per stroke 0.125 gallon, 1¼ or 1½ inch pipe	5 75
No. 5, 4½ inch caliber, capacity per stroke 0.16 gallon, 1½ or 2 inch pipe	6 25

CLOSE SPOUT PITCHER PUMP.

Fig. 100.

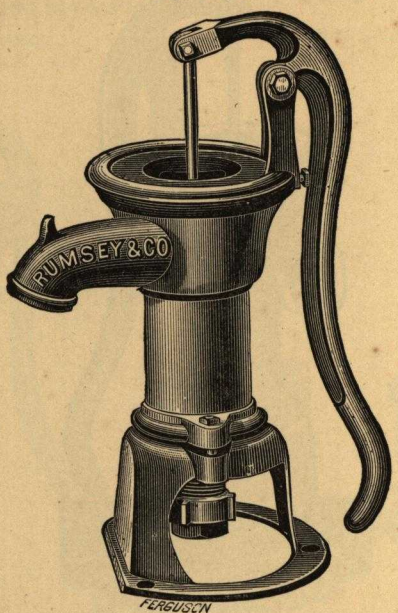


Fig. 100 represents our New Style of Pitcher Pump with a close spout. It will be found very neat and convenient in all its uses. By the improvement in construction the water is confined in the spout and cannot wash over, while a hook is attached for hanging a pail or bucket. In other features it is like Fig. 90, being made with a revolving brake, bolt fastenings, cut-off base and brass valve seat.

It combines the large cylinder of the Pitcher Pumps with the form of spout of the ordinary Cistern Pump, and has met with much favor wherever introduced.

These Pumps are also extensively used on the Driven Well.

We make them in five sizes, with either open or closed tops, as ordered, and fitted for lead or iron pipe connections, at same prices as our other Pitcher Pumps.

PITCHER SPOUT CISTERN PUMP.

Fig. 103.

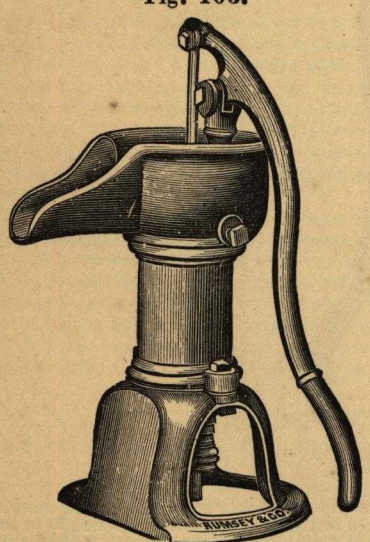


Fig. 103 shows our old reliable Open Top Pitcher Spout Cistern Pump. The design originated with us, and it is probably the most popular Pump now in existence, not only in the United States, but in foreign countries, being found specially adapted to the far-famed Driven Well. This Pump differs in construction from Figs. 90 and 99, by having the fulcrum placed at the bottom of the pitcher, where it is held in position by the set-screw shown in cut. It is made with revolving top and brass valve seat, and is rendered anti-freezing. We fit this Pump with "patent coupling," consisting of iron coupling for wrought iron pipe. For lead pipe connections, each Pump is provided with a brass soldering tube passing through the iron coupling.

SIZES, CAPACITY AND PRICES. (Figs. 100 and 103.)

No. 1, 2⅛ inch caliber, capacity per stroke 0.05 gallon, 1 or 1¼ inch pipe	$4 25
No. 2, 3 inch caliber, capacity per stroke 0.07 gallon, 1¼ or 1½ inch pipe	4 75
No. 3, 3½ inch caliber, capacity per stroke 0.10 gallon, 1¼ or 1½ inch pipe	5 25
No. 4, 4 inch caliber, capacity per stroke 0.125 gallon, 1¼ or 1½ inch pipe	5 75
No. 5, 4½ inch caliber, capacity per stroke 0.16 gallon, 1½ or 2 inch pipe	6 25

ANTI-FREEZING CISTERN AND WELL PUMP,

WITH CAST IRON EXTENSION PIPE (OR SET LENGTH), BRASS VALVE SEAT AND REVOLVING FULCRUM.

Fig. 105.

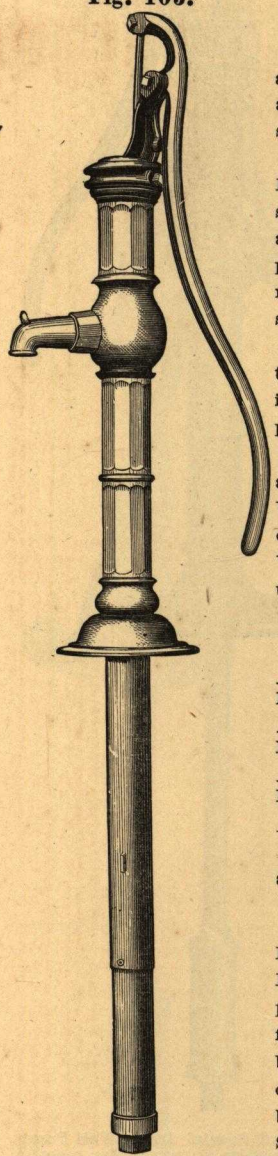


Fig. 105 represents our Anti-Freezing Cistern and Well Pump, which is a very attractive design, and specially intended for out-door cisterns and shallow wells.

It consists of a Standard, Base and Extension Pipe, or Set Length, into which the Cylinder is screwed. The inside of the extension pipe having a slightly greater diameter than the cylinder, the plunger can be readily withdrawn for purposes of repair or examination, by the same process prescribed for Fig. 101.

This Pump is anti-freezing, as the water left in the stock or extension pipe after pumping runs out immediately through a small hole, drilled for the purpose, at the top of the cylinder.

We recommend that our Foot Valve be always attached to the lower end of the suction pipe in all Well Pumps. In this class of Pumps, as in all others made by us, we invariably have the Brass Valve Seat. For description of Foot Valve to be used, see Fig. 126.

SIZES AND PRICES OF FIG. 105.

No. 3, 2½ in. Caliber, capacity per stroke 0.07 gallon, suitable for 1 in. pipe.....	$7 75
No. 4, 2¾ in. Caliber, capacity per stroke 0.08 gallon, suitable for 1¼ in. pipe.....	8 25
No. 4½, 3 in. Caliber, capacity per stroke 0.10 gallon, suitable for 1¼ or 1½ in. pipe	8 75

Fig. 126, 1¼ inch Foot Valve and Strainer for above Pumps, each, $2.25.

GOLDEN CROWN NEW SPECIAL DRIVE WELL PUMP,

WITH WROUGHT IRON EXTENSION OR SET LENGTH.

Fig. 91.

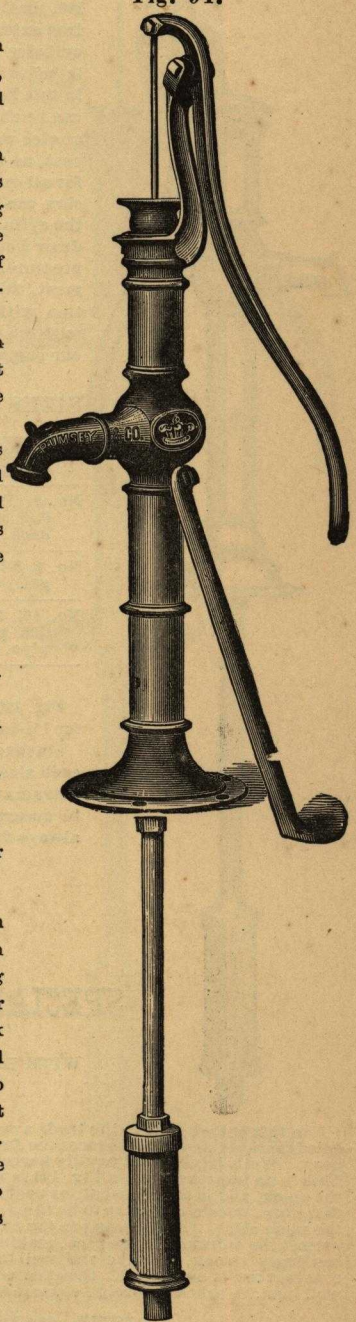


Fig. 91 represents our Anti-Freezing Cistern Pump, with Revolving Fulcrum and Wrought Iron Extension, which places the Cylinder and working parts three feet below the base, and out of danger from frost, as the water is allowed to run back below freezing point; the Pump can be lengthened out to suit the depth of the cistern. They have also been extensively used when fitted with our Patent Sand Valve in connection with the Driven Well. These Pumps, when set ready for use, should have our Improved Foot Valve and Strainer attached to the lower end of the Suction Pipe, which always keeps the valves in perfect working order.

SIZES AND PRICES OF FIG. 91.

No. 0, 3 inch Caliber, suitable for pipe 1¼ inch Caliber.....	$8 50
No. 00, 3¼ inch Caliber, suitable for pipe 1¼ inch Caliber.....	9 00
Add for Tight Top.....	0 75
Figure 126, Foot Valve with Strainer, suitable for pipe 1¼ inch Caliber.....	2 25

Standard and Cylinder, 50 cents less. This Pump has a Raised Brass Valve Seat.

OPEN-TOP, ANTI-FREEZING CISTERN AND WELL PUMP,

WITH WROUGHT-IRON EXTENSION, OR SET LENGTH.

Fig. 106.

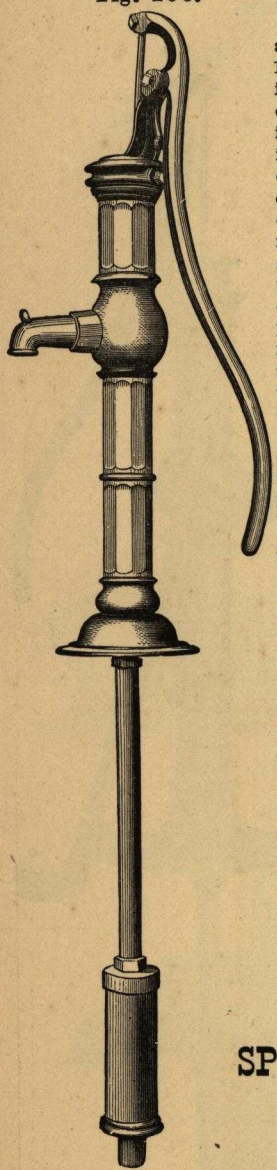


Fig. 106 exhibits our Anti-Freezing Cistern and Well Pump, very similar in design to Fig. 105, but made with wrought instead of cast iron extension, three feet in length, so that the cylinder attached to bottom of extension pipe is below the frost line. A marked advantage in this Pump over Fig. 105 is that the cylinder can be changed from a larger to a smaller size, or vice versa, as desired, with little trouble or cost, as the same extension pipe may be used for all ordinary sizes of cylinders. The extension can also be lengthened at any time, and the cylinder submerged to a sufficient depth to draw water from below the line of atmospheric pressure. With our patent Sand Valve attachment, this Pump is extensively used in connection with driven wells. This Pump is made with the usual Brass Valve Seat common to all our pumps.

SIZES AND PRICES OF FIG. 106.

No. 2, 2⅛-in. cyl., capacity per stroke 0.07 gal., suitable for 1-in. pipe, each	$7 75
No. 3, 2¾-in. cyl., capacity per stroke 0.08 gal., suitable for 1¼-inch pipe, each	8 00
No. 4, 3-in. cyl., capacity per stroke 0.10 gal., suitable for 1¼-inch pipe, each	8 50
No. 4½, 3¼-in. cyl., capacity per stroke 0.125 gal., suitable for 1¼ or 1½-inch pipe, each	9 00

Fig. 126, Foot Valve with Strainer, suitable for 1¼-inch pipe, each $2 25.

Standard and Cylinder only, 50 cents less, each size, than above prices.

SPECIAL NOTICE.—Our threads are all tool-cut to accurate gauges, so that our repairs will always fit.

Fig. 106½, No. 31.

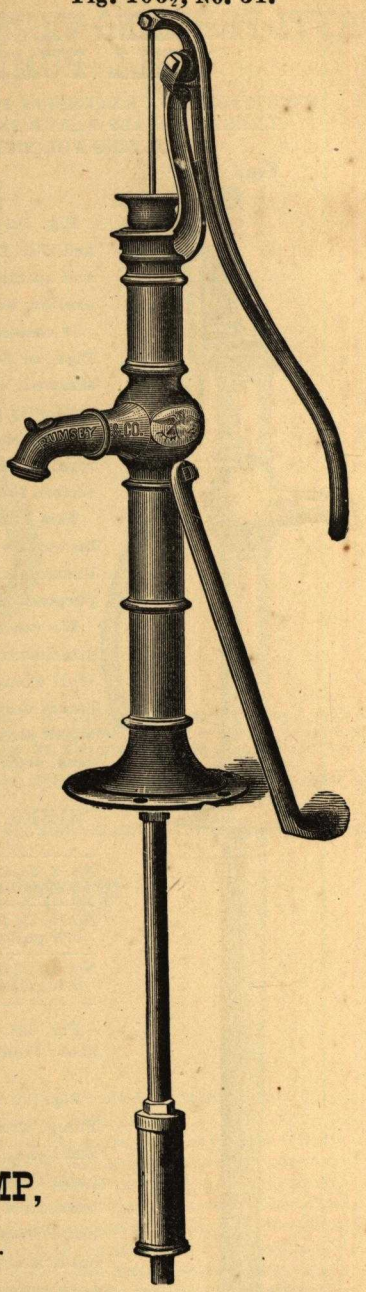


Fig. 106½.

SPECIAL DRIVE-WELL PUMP,

WITH BEST AND LATEST IMPROVEMENTS.

BRASS VALVE SEAT.

In this cut we offer to the trade a very correct representation of our new and improved Special Drive Well Pump. In advantages and conveniences the *Drive Well* is so widely known that its principles require no particular mention here. Well-drivers will readily perceive the superiority of this Pump over others constructed for the same purposes. This is an improvement on Fig. 106 in many respects. The extension pipe passes directly through the lower portion of the stock, and is connected at, or near, the spout by a gas-pipe thread cut in the stock at that point; the whole stock, therefore, does not require to be filled, so that water is raised more quickly and easily in this than in other Pumps of the same class. The opening in the stock near the base, through which the pipe passes, is of sufficient size to only permit the entrance of the pipe, making all practically as solid as though composed of one piece. This Pump is exceedingly strong, effective and well braced. This stability makes it especially desirable for *streets* or *parks*, where constant use is demanded. Great care is exercised in the construction, that the general endorsement given it by drive-well men, in this and foreign countries, shall be sustained by the popular verdict.

SIZES, CAPACITY AND PRICES OF FIG. 106½, No. 31.

	Open Top.	Close Top.
No. 31, 2⅛ inch caliber, capacity per stroke 0.07 gal., each	$8 25	$9 00
No. 31, 2¾ inch caliber, capacity per stroke 0.08 gal., each	8 50	9 25
No. 31, 3 inch caliber, capacity per stroke 0.10 gal., each	9 00	9 75

Fig 126. Foot Valve and Strainer for above Pumps, each, $2 25. Standard and Cylinder only, 50 cents less, each size, than above list. All of our Pumps have Brass Valve Seats. In ordering these Pumps please state for what size of pipe you desire them, always giving the inside diameter of pipe.

CLOSE-TOP CISTERN AND WELL PUMP,

WITH WROUGHT IRON EXTENSION A BRASS VALVE SEAT.

Fig. 107.

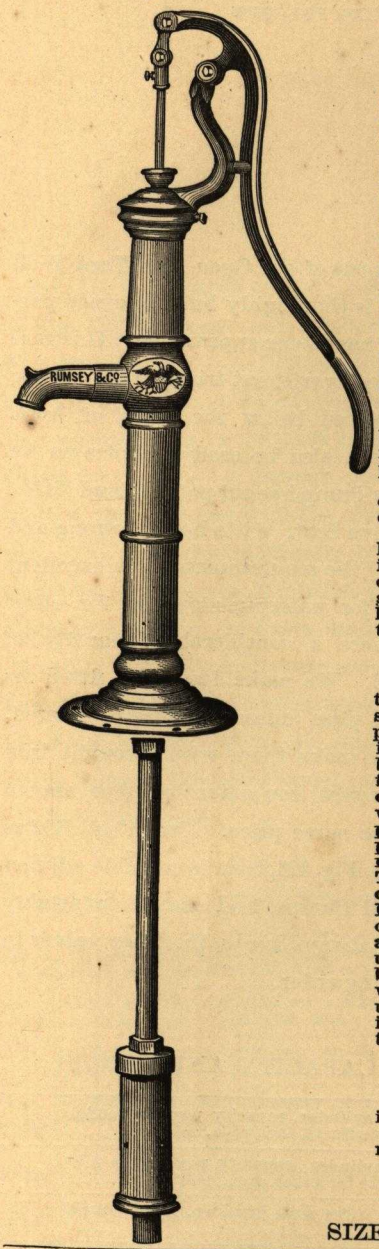


Fig. 107 accurately represents our Close Top Cistern and Well Pump. This improvement is to prevent any sticks, stones or foreign substances being thrown in the top and interfering with the proper efficiency of the Pump. The Close Top fully attains this end, which is a great advantage in most locations. This Pump is similar in general design, and embraces in construction all the points of merit contained in Fig. 106. We can connect any size of Cylinder to this Pump from 2 to 4 inches in diameter, including all ¼ inch intermediate sizes, at the same ratio of prices as those given below. Our customers will please bear in mind that the deeper the well, the smaller proportionately should be the cylinder. For example: if this Pump is intended for a cistern not exceeding 10 feet in depth, a 4 inch cylinder can be used to advantage, while for a 25 foot well a 3 inch cylinder should be preferred.

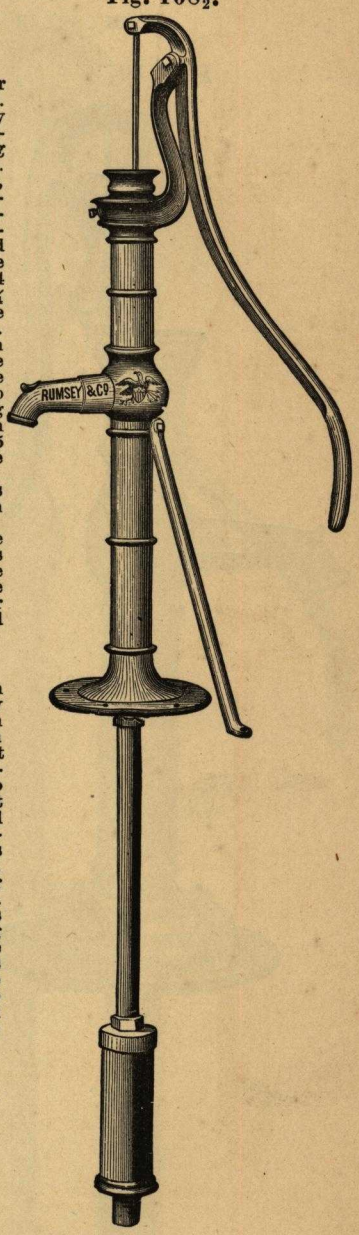
This Pump is recommended for wells or cisterns ranging from 15 to 25 feet in depth.

It is an established principle that the height of a column of water produces its own weight when multiplied by the quantity of water; consequently, the greater quantity added to the lesser height, equals the lesser quantity added to the greater height.

DRIVE WELL PUMP, WITH BRACE.

ANTI-FREEZING, BRASS VALVE SEAT.

Fig. 108½.



The Stock of Fig. 108½ is lighter than that of our Fig. 106½, but it is equally strong in proportion. The extension pipe passes up into the stock, to which it is connected at a point near the spout by a gas-pipe thread. Being anti-freezing, it is particularly adapted to out door exposure in the coldest weather. It is simple, serviceable and perfect in every part, and we can especially recommend it for use in wells ranging from 15 to 25 feet in depth. This Pump is supplied with a cylinder of 7 inch stroke, unless ordered longer. Like Figs. 106, 106½ and 107, cylinders of 2 to 4 inches diameter, including all intermediate diameters, can be used—the size of the cylinder always being proportioned to the depth of the well. Our patent Foot Valve is also used here, and the utmost care taken in every detail of the entire construction of the Pump.

Foot Valve and Strainer, Fig. 126, 1¼ inch pipe, $2.25.

Our threads being cut to exact gauges, repairs will always fit.

SIZES AND PRICES, FIG. 107.

No. 3, 2¾ inch cylinder, capacity per stroke 0.08 gallon, each	$8 75
No. 4, 3 inch cylinder, capacity per stroke 0.10 gallon, each	9 25
No. 4½, 3¼ inch cylinder, capacity per stroke 0.125 gallon, each	9 75

SIZES AND PRICES, FIG. 108½.

No. 30, 2½ inch cylinder, capacity per stroke 0.07 gallon, each	$8 25
No. 30, 2¾ inch cylinder, capacity per stroke 0.08 gallon, each	8 50
No. 30, 3 inch cylinder, capacity per stroke 0.10 gallon, each	8 75
No. 30, 3¼ inch cylinder, capacity per stroke 0.125 gallon, each	9 00

For Standard and Cylinder only, 50 cents less each size than above prices.

LARGE SIZE ANTI-FREEZING YARD WELL PUMP,

WITH CAST IRON EXTENSION PIPE AND REVOLVING FULCRUM.

Fig. 110.

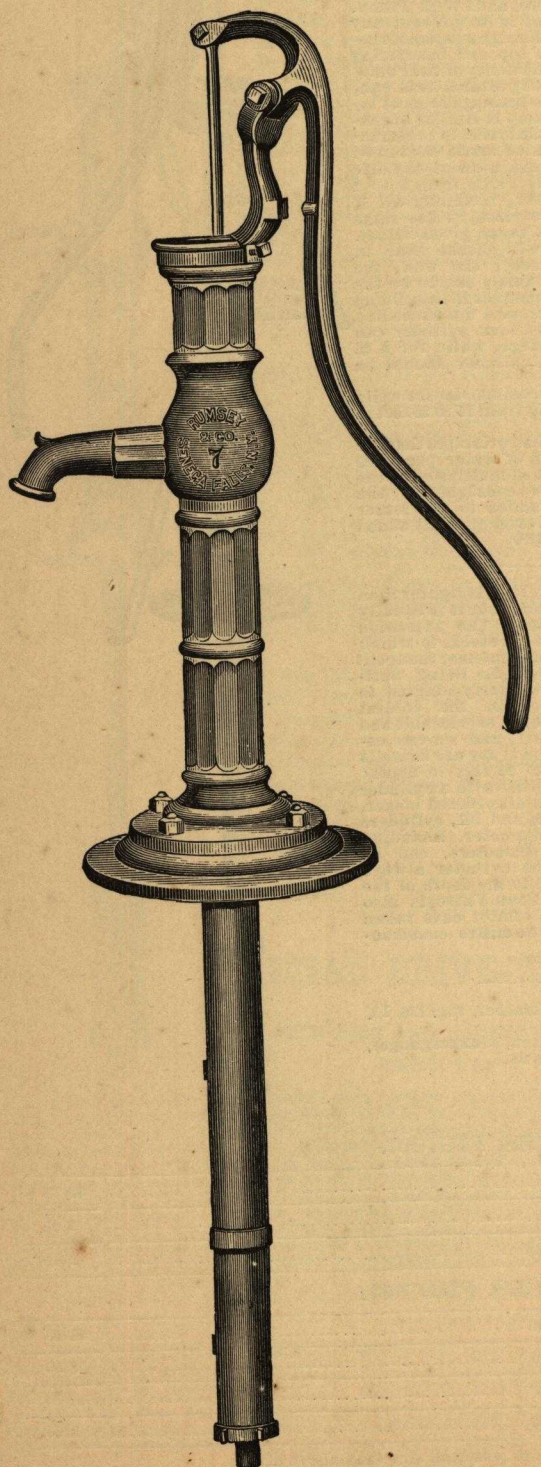


Fig. 110 is a cut of our Open Top Yard Well Pump. This is thoroughly built in every particular and of handsome appearance. It is rendered anti-freezing without tripping the valves, they being placed below the reach of frost. The plunger can also be easily withdrawn for repairs. This Pump has our patent Sand Valve and brass Valve Seat. It is heavy, strong and fully meets all the requirements of an excellent Farm Pump for watering stock, or for other purposes where a considerable quantity of water is used. We make two sizes, fitted for wrought iron pipe, unless cast iron is ordered. If desired, we make them with wrought iron instead of the cast iron extension pipe, shown in cut, at the same price. Our Foot Valve with Strainer, Fig. 126, is an invaluable adjunct to these Well Pumps, and should invariably be used, as it always keeps the other valves in perfect working order.

SIZES, CAPACITY AND PRICES.

No. 5, 3¼ inch cylinder, capacity per stroke 0.121 gallon, suitable for 1¼ inch pipe, each	$12 00
No. 5, 4 inch cylinder, capacity per stroke 0.20 gallon, suitable for 2 inch pipe, each	13 00
Fig. 126, Foot Valve with Strainer, for 1¼ inch pipe, each	2 50
Fig. 126, Foot Valve with Strainer, for 2 inch pipe, each	3 00

All of our Pumps have Brass Valve Seats.

This Pump is recommended for wells varying from 15 to 25 feet in depth.

LARGE SIZE TIGHT TOP YARD WELL PUMP.

Fig. 111.

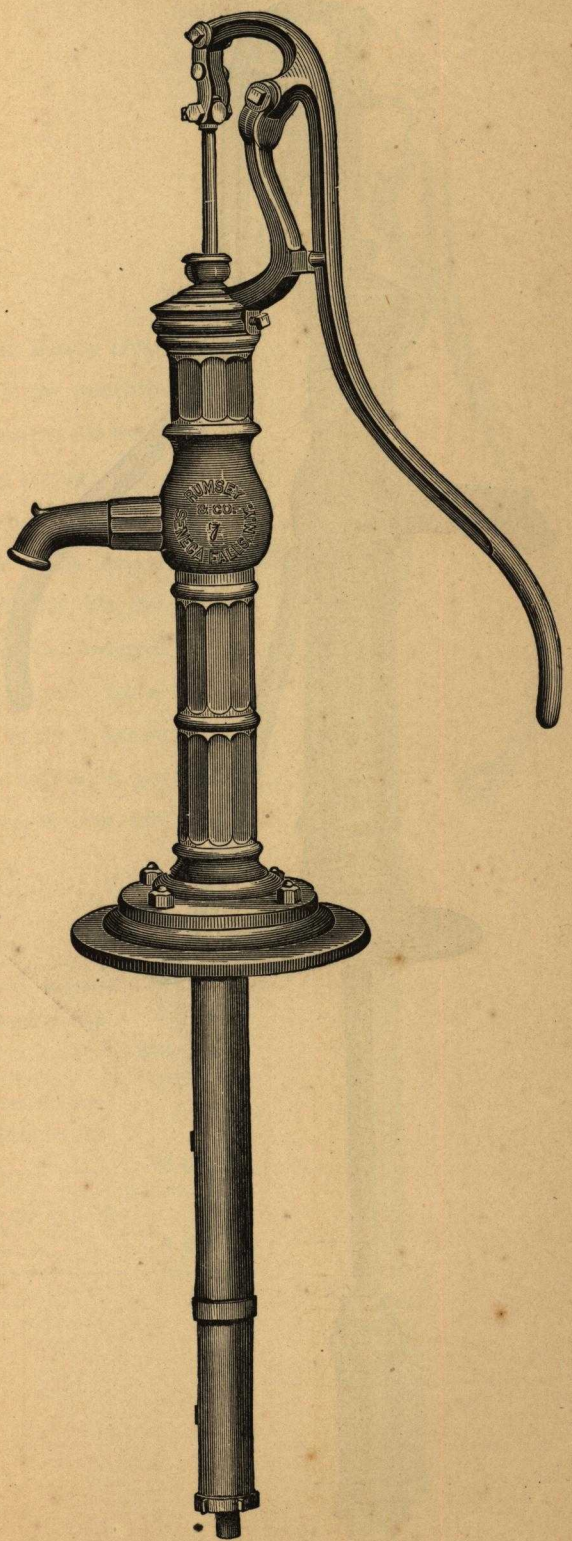


Fig. 111 is substantially the same design as Fig. 110, and adapted to similar purposes. The fulcrum, however, which is revolving like the Open Top, in this Pump is closed, so that nothing can be dropped in at the top either by accident or through malicious intention, and interfere with the correct working. The rod works vertically by means of iron buckles, or straps, jointed at two points, allowing the lever to move freely without diverting the rod from its true position. The base is very large and strong, insuring steadiness and stability upon the platform. All other features described under Fig. 110 will apply to this Pump.

SIZES, CAPACITY AND PRICES.

No. 7, 3½ inch cylinder, capacity per stroke 0.125 gallon, suitable for 1½ inch pipe, each..	$15 00
No. 7, 4 inch cylinder, capacity per stroke 0.20 gallon, suitable for 2 inch pipe, each.....	16 00
Fig. 126, Foot Valve with Strainer, for 1½ inch pipe, each.....	2 50
Fig. 126, Foot Valve with Strainer, for 2 inch pipe, each.....	3 00

All our threads are cut to exact gauges, so that all our repairs fit.

This Pump is recommended for wells varying from 15 to 25 feet in depth.

PATENT CLOSE TOP GAS SET PUMPS,

FOR WELLS UP TO 25 FEET IN DEPTH. ANTI-FREEZING, WITH WROUGHT IRON EXTENSION (OR SET LENGTH).

Fig. 115½.

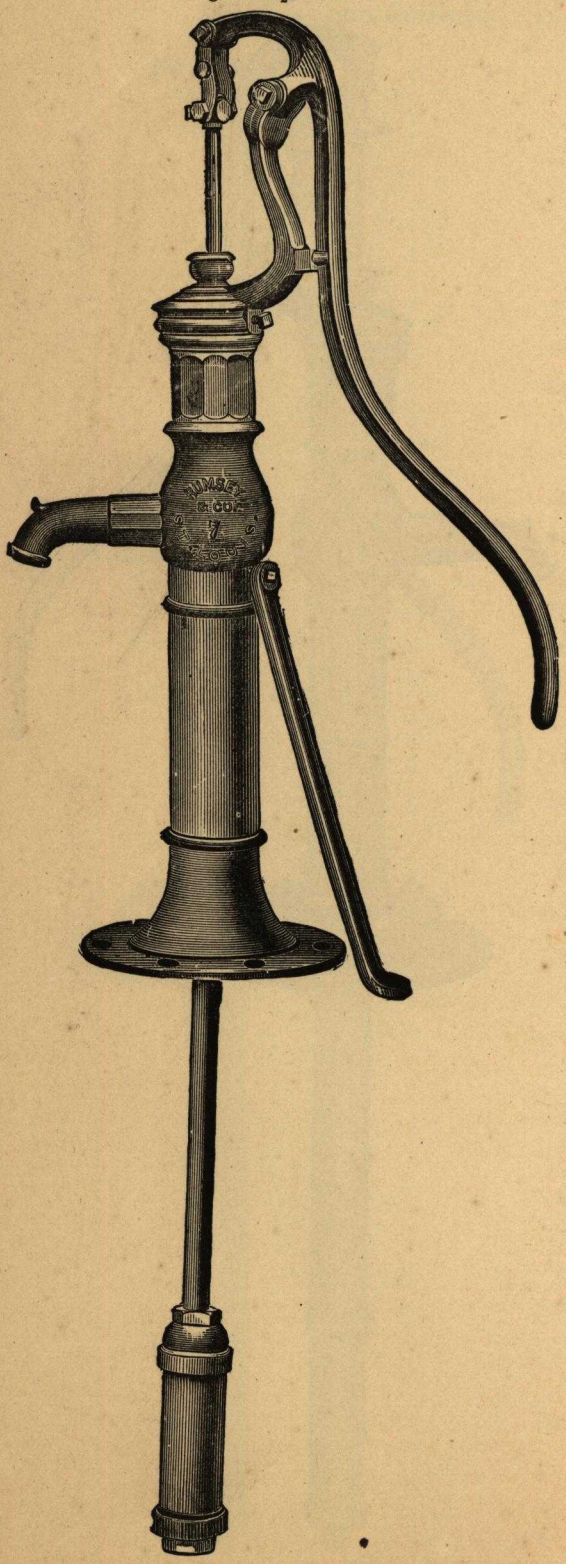


Fig. 115½ represents our full size No. 7¾ Stock Well Pump, anti-freezing, with wrought iron extension (or set length), revolving fulcrum and rubber buffer, to relieve the concussion of the lever at the termination of its downward stroke, for the use of cisterns and wells not exceeding twenty-five feet in depth.

Fig. 115½, No. 7, Gas Set Length.....	$16 00
Foot Valve and Strainer, Fig. 126, 1½ in. pipe.	2 50

LARGE ANTI-FREEZING LIFT PUMP,

FOR WATERING STOCK.

Fig. 113.

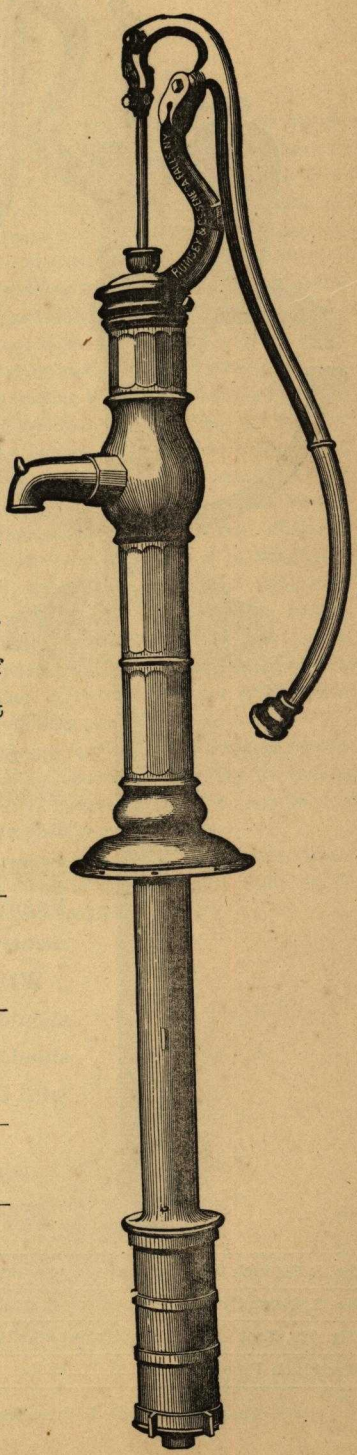


Fig. 113 represents our new Anti-Freezing Heavy Iron Lift Pump, made expressly for those who have large quantities of water to raise for stock and farm purposes generally, for wells not exceeding twenty-five feet in depth. It being strong, plain and durable, renders it invaluable to the farmer who resorts to wells and cisterns for his supply of water. For wells exceeding twenty-five feet in depth, see Figs. 118, 119, 120, 122, 273, 299 and 308. Fitted for wrought iron pipe, unless otherwise ordered.

These Pumps, when set ready for use, should have our Improved Foot Valve and Strainer attached to the lower end of the suction pipe, which always keeps the valves in perfect working order. For description of Foot Valves, see Fig. 126.

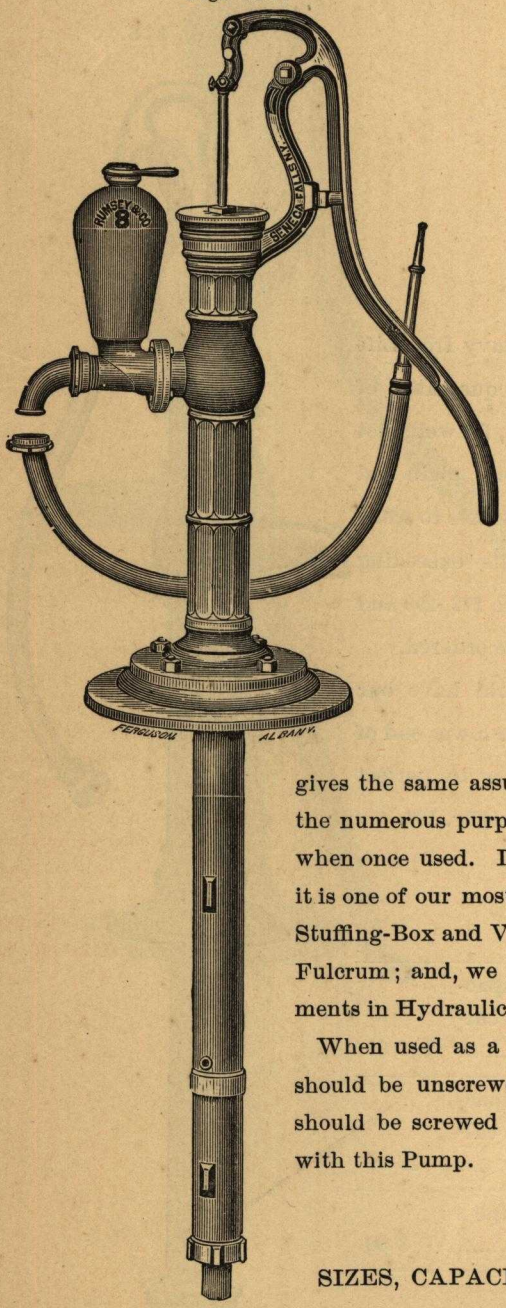
SIZES AND PRICES.

No. 8, Close Top; caliber of cylinder, 5 inches; capacity per stroke, 0.33 gal.; suitable for pipe 2 inches caliber, each	$18 00
No. 8, Open Top; caliber of cylinder, 5 inches; capacity per stroke, 0.33 gal.; suitable for pipe 2 inches caliber, each	16 00
Fig. 126, Foot Valve with Strainer, suitable for pipe 2 inches caliber	3 00

ENGINE WELL FORCE PUMP.

ANTI-FREEZING, WITH CAST IRON EXTENSION PIPE, FOR WELLS UP TO 25 FEET IN DEPTH.

Fig. 117.



The cut, Fig. 117, represents our No. 8 Engine Well Pump, fitted with Cast Iron Extension Pipe, instead of the Wrought Iron one shown on page 546, Fig. 115. In other respects both Pumps are alike. With one of these Pumps, and a reasonable complement of Hose, the farmer can bid defiance to the fire fiend, for if his house, barn or stack be struck by lightning, or ignited by accident or incendiary, a competent Fire Engine is at hand and ready for use on the instant, without requiring a "mechanical engineer" to manipulate it, as a child soon becomes familiar with its efficient and simple operation. Being anti-freezing, it can be fully relied upon in all seasons, situations and emergencies, and contributes to the possessor a sense of security and comfort, almost equal to a policy in a good insurance company. To the residents of towns and cities, its multifarious merits gives the same assurance of freedom from danger in many cases, and the numerous purposes to which it is adapted make it indispensable when once used. In addition to the "engine" feature of this Pump, it is one of our most reliable Lift or common Well Pumps. The Rod, Stuffing-Box and Valve Seat are all Brass. It has Rubber Buffer in Fulcrum; and, we may add, embodies all the latest possible improvements in Hydraulic Machinery.

When used as a Lift Pump alone, the nut on top of Air-Chamber should be unscrewed 3 or 4 turns; when used with hose, the nut should be screwed down tightly. Always use Foot Valve, Fig. 126, with this Pump.

SIZES, CAPACITY AND PRICES.

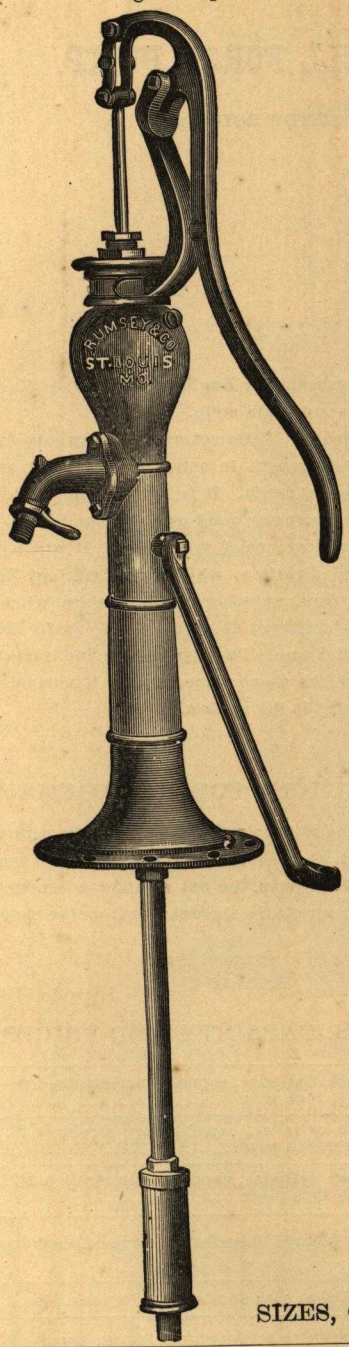
No. 8, 3¼ inch Cylinder, capacity per stroke 0.125 gallon, suited for 1½ pipe, each	$20 00
No. 8, 4 inch Cylinder, capacity per stroke 0.20 gallon, suited for 1½ or 2 inch pipe, each	22 00
Fig. 126, Foot Valve with Strainer, for 1¼ inch Pipe, each	2 50
For 2 inch Pipe	3 00

Above prices include three feet Hose and Discharge Pipe. We bore and polish all our Cylinders.

ANTI-FREEZING LIFT AND FORCE PUMP,

WITH WROUGHT IRON EXTENSION PIPE.

Fig. 114½.



The annexed cut represents our New Tube Well Force Pump, designed and constructed specially to supply a necessity long existing in the Driven Well trade. There is a universal demand from all quarters for a reliable Pump to fill such a vacancy, at once combining strength, symmetry, utility and cheapness, and from our numerous testimonials and orders for this particular Pump we know that it fulfills all these requirements, and stands peerless amongst all others of its class. Like all our Force Well Pumps, it has a brass rod, which does not corrode and tear out the packing, so that the bad leakage at the stuffing box, so common to this class of pumps, is effectually avoided. The stock and air chamber are made in one piece, with a tube extending downward through the latter, at once preventing the escape of air from the chamber and providing the best possible guide for the piston rod below the brass stuffing box in the cap. Hose can readily be connected to the spout by means of an attachment provided (gratuitously) for this purpose. It is made anti-freezing in the same manner as all of our Extension Pumps, the cylinder being placed three feet below the surface of the ground or platform, and having a vent-hole drilled at or near the top of the cylinder, allowing the escape of all water from the stock and connecting pipe after pumping.

These Pumps are arranged for Wells not exceeding twenty-five feet in depth, but by placing the cylinder or working parts within 15 feet from bottom of the well, can be used where the well is of fifty feet or greater depth.

DIRECTIONS.—When used as a Force Pump, the thumb screw in air chamber should be screwed tight. Take out the screw when used as an ordinary Lift Pump.

SIZES, CAPACITY AND PRICES.

No. 10½, 3 inch bore, capacity per stroke 0.10 gall., suitable for 1¼ inch pipe, each	$13 50
No. 10½, 3¼ inch bore, capacity per stroke 0.125 gall., suitable for 1¼ inch pipe, each	14 00
No. 10½, 3½ inch bore, capacity per stroke 0.16 gall., suitable for 1¼ inch pipe, each	14 50

For Standard and Cylinder only, same list price.

For three feet of hose and discharge pipe, list price, extra	$ 3 00
Fig. 126, Foot Valve and Strainer, 1¼ inch pipe	2 25
Fig. 126, Foot Valve and Strainer, 1½ inch pipe	2 50

ANTI-FREEZING ENGINE WELL FORCE PUMP,

WITH REVOLVING FULCRUM, BRASS PISTON ROD, ETC.

Fig. 115.

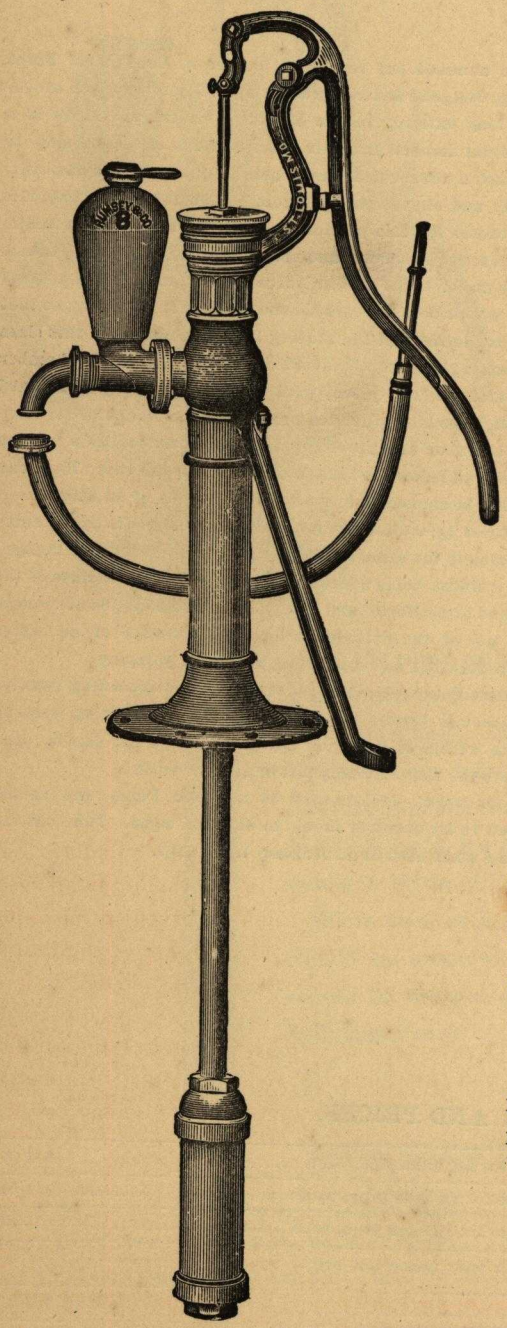


Fig. 115 represents our Engine Well Pump. We manufacture three sizes of this style.

It is intended for Wells not exceeding twenty-five feet in depth, but its strength is amply sufficient for service in wells of twice that depth. It is hardly requisite to enumerate or explain the many good qualities, as the cut portrays perfectly the appearance of this Pump. It will force water in any desired direction, while as an efficient Engine for extinguishing fires, watering lawns, washing windows, carriages, etc., it is without an equal. It is equally serviceable as a Lift Well Pump. Its relative size and varied utility, combined with the cheap price, renders it unrivaled by any Pump of the kind in the market.

DIRECTIONS FOR MANAGEMENT.

The nut on top of the air chamber should be screwed down perfectly tight when used as a Force Pump. When used as an ordinary Lift Pump, the nut must be unscrewed two or three turns, to permit the air to escape from the chamber.

SIZES, CAPACITY AND PRICES.

No. 6½, 2¾ inch Cylinder, capacity per stroke 0.08 gall., for 1¼ inch pipe	$16 00
No. 7½, 3 inch cylinder, capacity per stroke 0.10 gall., for 1¼ inch pipe	18 00
No. 8½, 3¼ inch cylinder, capacity per stroke 0.125 gall., for 1¼ inch pipe	20 00

Above prices include three feet of hose and discharge pipe.

Fig. 126, Foot Valve with Strainer for 1¼ inch pipe.	$2 25
For 1½ inch pipe	2 50

Standard and Cylinder only, same list prices.

PATENT OPEN TOP STANDARD, WITH CYLINDER,

FOR WELLS OF ANY DEPTH, UP TO 100 FEET.

Fig. 119.

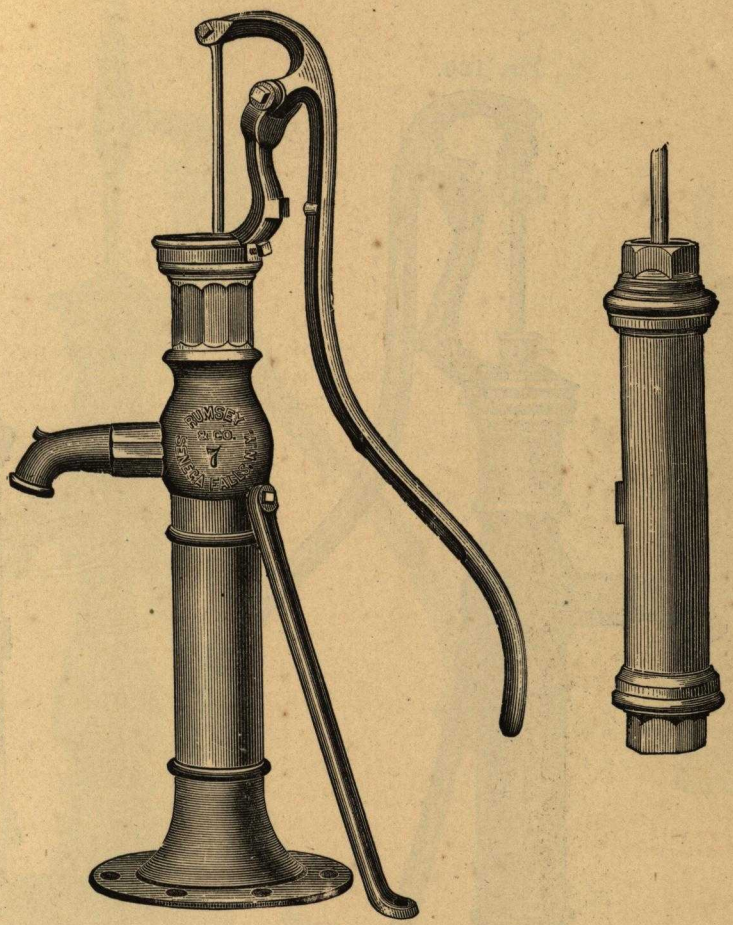


Fig. 119 correctly represents our Extra Strong Open Top Standard and Cylinder. We strongly recommend it for use in all wells ranging from 20 to 100 feet in depth, and in all cases will cheerfully guarantee perfect satisfaction. When the depth of well is not given in the order, we furnish cylinder of 3 inches diameter, with ample stroke for the full capacity of the Pump. When the depth of Well is stated, we will send the cylinder proportioned to such depth, if so desired.

Our Foot Valve, Fig. 126, should be used in all cases in connection with these Pumps. The capacity, per stroke, of all our cylinders will be found annexed to cuts of cylinders at the close of the Well Pump series. These Pumps are all fitted for wrought iron pipe of 1½-inch caliber, unless otherwise ordered.

Fig. 119, No. 7, Standard and Cylinder, for 1½-inch pipe, each	$14 00
Fig. 126, Foot Valve, with Strainer, for 1½-inch pipe	2 50

If intended for use in drilled wells, mention size of drilled hole. All kinds and sizes of our Cylinders are carefully bored and polished.

PATENT CLOSE-TOP STANDARD AND CYLINDER,

FOR WELLS UP TO 50 FEET IN DEPTH.

Fig. 120.

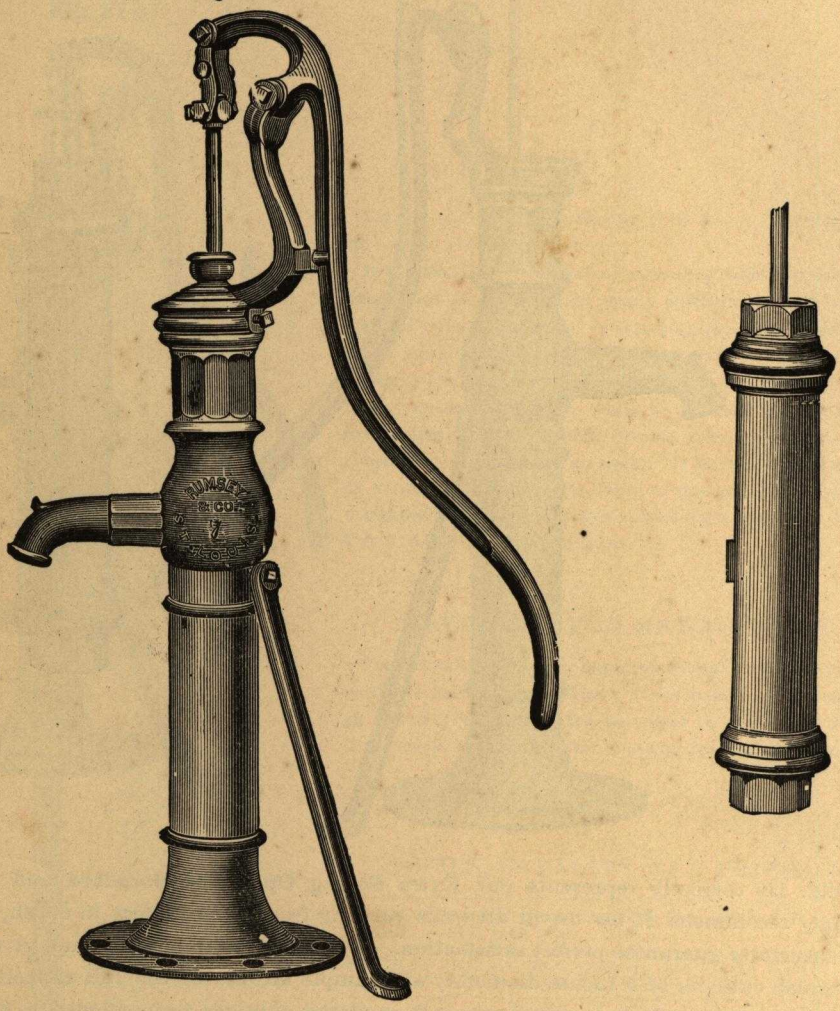


Fig. 120 represents our New Patent Tight-Top Standard and Cylinder, constructed upon the same principle as Fig. 122, but not so heavy, strong and substantial as that Pump. It was gotten up to meet the wants of the community at large, as a lighter and cheaper Pump than No. 29, Fig. 122, and is often required for wells from 20 to 50 feet in depth. The Cylinder furnished is the same as shown on pages 558 and 559, of 3 inches caliber, fitted for wrought-iron pipe, 1½ inches caliber, unless otherwise ordered. These Pumps, when set ready for use, should have our Improved Foot Valve and Strainer attached to the lower end of the Suction Pipe, which keeps the valves in perfect working order.

SIZE AND PRICE.

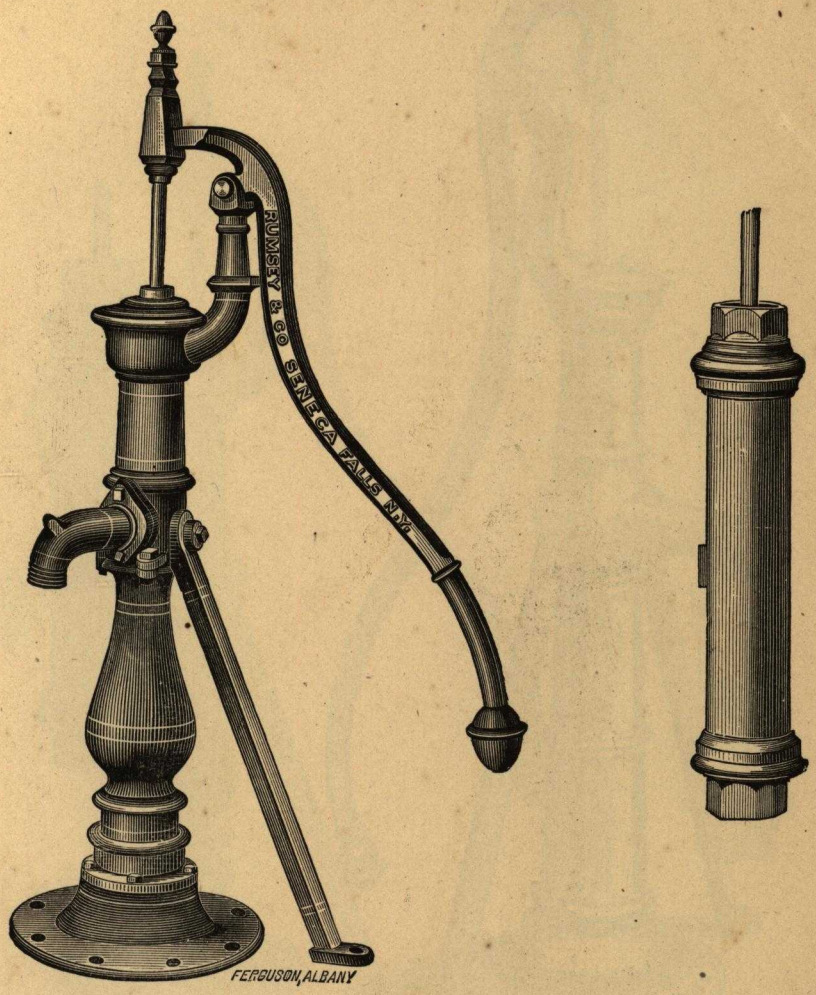
No. 7¾, Fig. 120, Standard and 3-in. Iron Cylinder, for pipe 1½-inch caliber	$16 00
Fig. 126, Foot Valve and Strainer, for pipe 1½-inch caliber	2 50

If for Drilled Well, state size of drilled hole. For prices of all kinds of Cylinders, see pages 558 and 559.

IMPROVED SECTIONAL DEEP-WELL STANDARD,

WITH BRACE, BOLTED BASE, VERTICALLY WORKING BRASS ROD.

Fig. 299.



The above cut represents our new Sectional Deep Well Standard. This Pump has many advantages over the one-piece Standards, which we are confident that the trade will not be slow to recognize. It is made in four sections, either of which can be replaced by a new piece at one-quarter the cost of the whole stock. The difference in the length between the fulcrum and weight end, and fulcrum and power end of the lever, is so great that very heavy work can be done with comparative ease. The mode of connecting the working-rod to the end of the lever retains the rod in a vertical position at all points of the stroke, a feature which will recommend itself to all practical Pump men. The fulcrum, or bearer, is very strong, as is the brace also. The above are but a few of the commendable features of this Pump, which we offer to the trade.

SIZES, CAPACITY AND PRICES.

No. 3, 3-inch cylinder, capacity per stroke 0.10 gal., 1¼ inch pipe	$17 00

This price includes Cylinder.

Fig. 126, Foot Valve with Strainer, suitable for pipe 1¼-inch caliber	$2 25
Same, for pipe 1½-inch caliber	2 50

These Pumps can be furnished with any size Cylinder, and fitted with 1¼ or 1½-inch pipe. When ordering, state size of Cylinder wanted, also size of Pipe. See pages 558 and 559 for prices on Cylinders.

PATENT TIGHT TOP STANDARD, WITH CYLINDER,

WITH TWO BRACES.

Fig. 122.

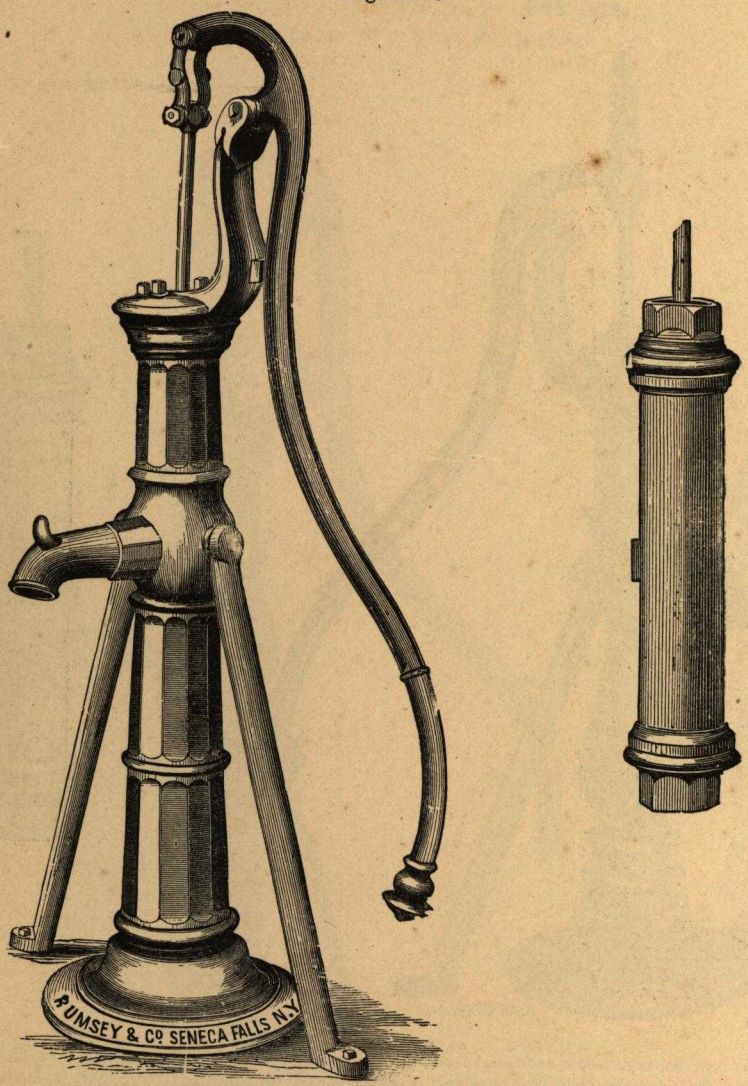


Fig. 122, No. 29, is an accurate representation of our Tight Top Standard Artesian Well Pump. This is a very strong and compact Pump, well calculated to sustain, without injury, the hard usage always received by a street Pump. In addition to an unusually large base are two strong braces, which, bolted firmly to the platform of the well, effectually prevent all possibility of the Pump working loose by the hardest test to which it may be subjected. The bearer or fulcrum is connected to an annular ring, inside of the stock, by three bolts, and revolves to any desired position. It is also provided with a rubber buffer, which obviates the concussion at the close of each stroke, and absolutely prevents the breakage of the lever by any carelessness. Nothing injurious to the working of the valves can, by any possibility, get into this Pump. We recommend this Pump as permanent and suitable for any depth of well of less than 200 feet, and guarantee good satisfaction in its use.

We furnish, at the most reasonable rates, rods of solid iron or of gas pipe, with the necessary pipes and connections for wells of any depth. We make eight sizes of cylinders suitable for this Pump, viz: 2, 2¼, 2½, 2¾, 3, 3¼, 3½ and 4 inch, either of brass or iron, or a combination of both metals. An iron cylinder of 3-inch diameter, of ample stroke, will be sent with these Pumps, unless otherwise ordered.

SIZE AND PRICE.

Fig. 122, No. 29, Artesian Standard with Cylinder, for 1½-inch pipe	$20 00
Fig. 126, Foot Valve, for 1½ inch Pipe	2 50

Please state if well is drilled or dug well. If drilled, give size of hole. For prices of all kinds of Cylinders, see pages 558 and 559.

IMPROVED SECTIONAL DEEP WELL FORCE PUMP STANDARD,

FOR WELLS UP TO 150 FEET DEEP.

Fig. 308.

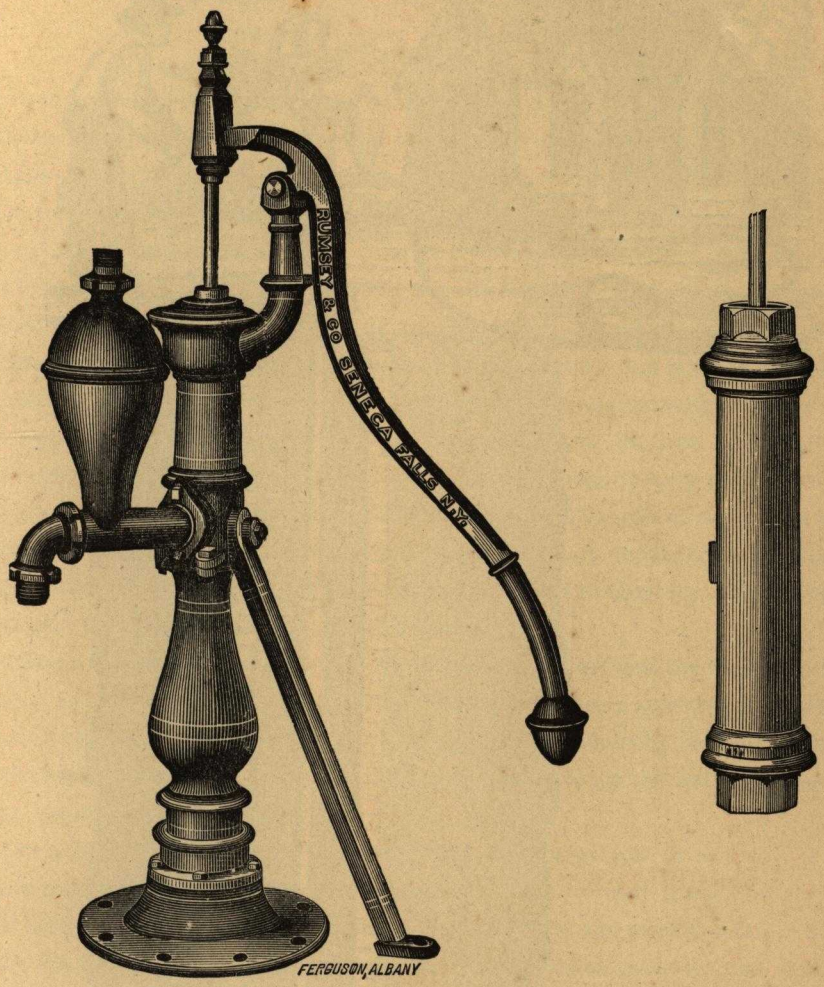


Fig. 308 is the same as Fig. 299, with the addition of an air-chamber to make a Force Pump Standard.

The distinguishing feature of both Standards consists in their being built in four sections, which will be found much more convenient for setting than when they are all made in one casting. They are so highly economical, as either section can be replaced at one-quarter the cost of the whole stock. They have a strong brace and lever, with brass rod, and accomplish heavy work with comparatively little labor. Fig. 308 has screw thread cut on the end of spout, and is arranged for coupling a hose tube for attaching hose, making it a very valuable and efficient engine for fire protection, or for washing windows, carriages, etc.

SIZES, CAPACITY AND PRICES.

No. 3, 3 inch Cylinder, capacity of stroke 0.10 gall., size of Pipe 1¼ inch	$20 00

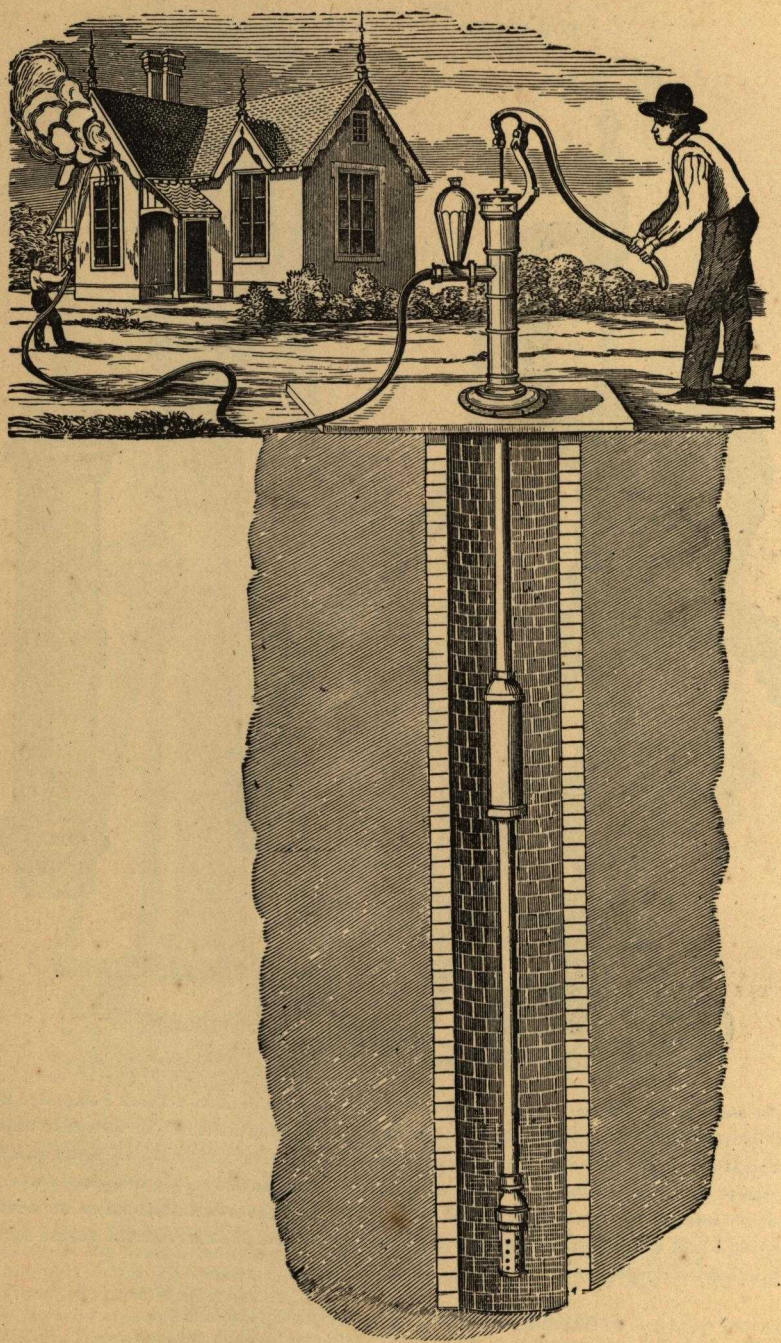
For 3 feet Hose and Discharge Pipe, add $3.00 to list price. Prices include Cylinder.

Fig. 126, Foot Valve with Strainer, suitable for pipe 1¼ inch Caliber	$2 25
Fig. 126, Foot Valve with Strainer, suitable for pipe 1½ inch Caliber	2 50

These Pumps can be furnished with any size Cylinder, fitted for either 1¼ or 1½ inch Pipe. When ordering, give size of Cylinder, also size of Pipe. For prices of Cylinders, see pages 558 and 559.

ENGINE WELL PUMP,

FOR WELLS FROM 10 TO 150 FEET.



Parties ordering Pumps should give exact depth of well, also depth of water usually in well.

DIRECTIONS.—When used as a common pump, the nut on top of air chamber should be unscrewed about two or three turns; when used with the hose, it should be screwed down perfectly tight.

Warranted to give good satisfaction. Also not effected by frost in the coldest climate, provided the well or cistern is properly covered up.

The above cut represents our Engine Well Pump, for cisterns or wells. It is adapted not only to the ordinary uses of a Well Pump, but also to the washing of windows, buildings, vehicles and the extinguishing of fires. Having an air chamber, it combines all the principals of a Double-Acting Fire Engine. With three feet of hose and a discharge pipe, water can be thrown over a two-story building, and, with sufficient hose, can be carried over the entire premises. This we deem one of the most practical improvements of the day, since every house in town or country may have not only the convenience of a good Well Pump, but, at the same time, be always supplied with a first rate Fire Engine.

This Pump should be used with Rumsey's unrivaled Cylinder, with Improved Foot Valve and Strainer.

The cut shows our No. 8½ Pump with Cylinder, set in a well and in operation. For prices and description of this Pump, see Fig. 118, pages 553, 554 and 555.

RUMSEY'S PATENT ANTI-FREEZING DEEP WELL LIFT AND FORCE PUMPS,

FOR WELLS FROM 5 TO 150 FEET DEEP.

We have the pleasure of offering to our friends and customers an assortment of improved and perfect articles of Deep Well Pumps, secured by Letters Patent from the United States. These are the Pumps so long needed for raising water from wells which are of too great depth for common Suction Pumps. By the engraving, page 552, it will be seen that the Cylinder, or working part, is placed down within fifteen feet from the bottom of the Well, with Foot Valve and Strainer at lower end of Pipe. The Connecting Pipe above the Cylinder is the common Wrought or Galvanized Gas Pipe of the market. The Standard and Cylinder are cut for the Gas Pipe threads of the different sizes as may be desired. The Connecting Rod is made of either common half-inch round iron, or ⅝ inch gas pipe, either plain or galvanized, as may be desired. We would recommend the gas pipe, however, in preference to the iron rod, as it is quite as strong and durable, and much lighter, which is a great advantage in deep wells, as the weight of the rod adds to the heavy working of any Deep Well Pump. This rod works within the gas pipe. We furnish all these Deep Well Pumps complete for wells of any depth, or we furnish Standards and Cylinders, and those purchasing can fit them up to suit themselves. We charge extra for cutting pipe and fitting it for any exact depth of well.

These Pumps can be put in operation in the deepest wells without the trouble of going down into the well. In setting the Pump, parties should take great pains in screwing the pipe and rod well together, as every joint should be screwed home to prevent accident by leakage, or rods pulling apart. After setting the Pump, the pipe should be firmly braced in the well to prevent swinging, and thereby loosening the joints.

We make a very extensive line of Cylinders, both of brass or iron, of any size or length, and suited to any need or purpose. See pages 558 and 559. We warrant these Pumps in every particular, and they cannot be surpassed for simplicity, durability and workmanship. See Figs. 118, 119, 120, 122, 273, 299 and 308, which should all be fitted up, when ready for use, similar to Pump on page 552.

SPECIAL NOTICE.

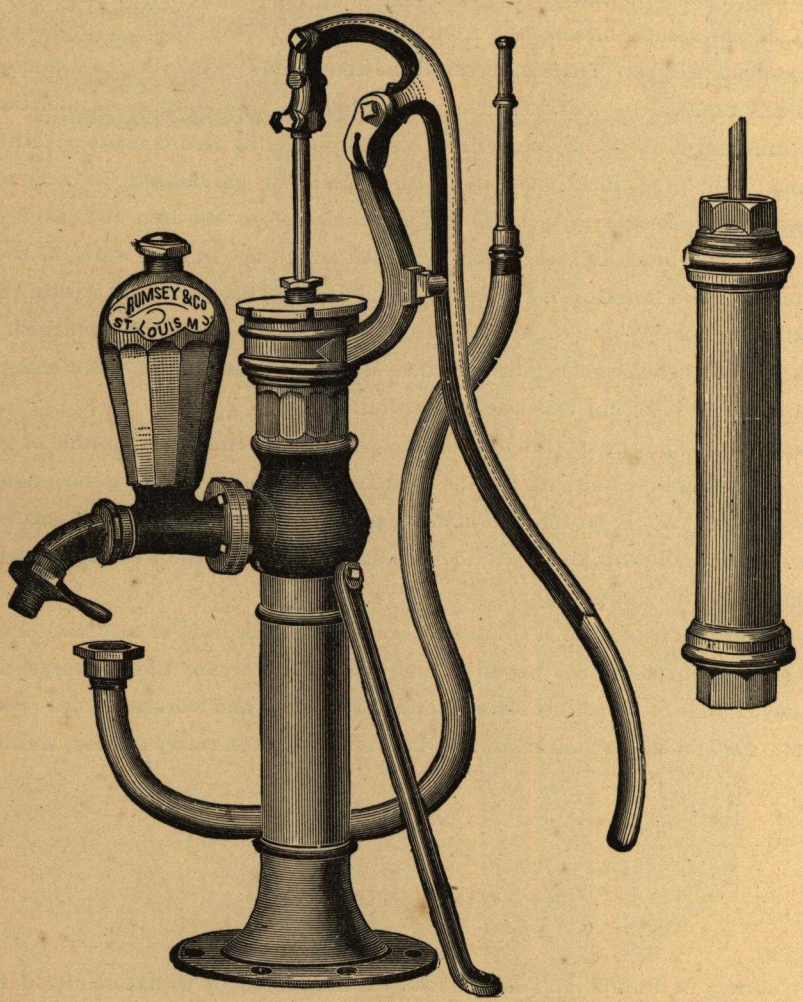
The great variety of Pumps and other goods manufactured by us has rendered necessary a system of designing them by Figures placed directly over the cut of each article, and the various sizes of each Figure by Numbers. Therefore, in sending orders, merely give the Figure, and also the Number of Pump, with Caliber of Cylinder, and much written description will be avoided. Also state if Pump is wanted to be fitted for lead or iron pipe.

As we publish many editions of our Catalogue, always mention the year when issued.

RUMSEY'S PATENT ENGINE WELL PUMP.

STANDARD AND CYLINDER, FOR DEEP WELLS.

Fig. 118.



For description and prices of this Pump, see next page.
For above Pump, fitted with Wooden Levers, see Fig. 273, page 556.

RUMSEY'S PATENT ENGINE WELL PUMP.

Fig. 118 represents our Engine Well Pump, Standard and Cylinder, designed for use in wells ranging in depth from 10 to 150 feet. It combines the qualities of Suction and Force Pumps. Having a very large Air-Chamber connected to the discharge, it easily throws a steady, powerful stream to a distance of 50 to 75 feet from hose pipe, and is really equal to a Double-Acting Fire Engine of the same size. For watering parched lawns or trees, cooling the atmosphere by throwing water upon the house and grounds in dry summers, saving property in case of fire, washing carriages and windows, etc., it is invaluable and without an equal.

The Piston and Valves may be placed at any depth corresponding to the depth of the well, but always within the limit of atmospheric pressure.

We furnish pipe of all kinds for use with these Standards; also rod and rod-couplings of every description. But for very deep wells we recommend the use of hollow rod (gas pipe), it being much lighter than solid iron, and sufficiently strong for all depths of wells. We make eight sizes of Cylinders for these Pumps, either of brass or iron, as follows: 2, 2¼, 2½, 2¾, 3, 3¼, 3½ and 4 inches caliber, with inside attachments with flush joints for drilled wells, or with outside attachments for dug wells, all being of the best quality of material and workmanship. These Pumps can be placed in operation in the deepest wells, without personally going down into the well. In setting the Pump great care should be taken to screw the pipe and rod well together; every joint should be perfect to prevent leakage, from the pipes and rods coming apart. The pipe should be well braced, that no swinging will loosen the joints. The Pumps are warranted in every respect, and for simplicity and durability are unsurpassed.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cylinder.
No. 8½, 3 inch cylinder, capacity per stroke 0.10 gallon, size of pipe 1¼ inch.....	$20 00	$26 00
No. 8½, 4 inch cylinder, capacity per stroke 0.33 gallon, size of pipe 1½ or 2 inch.....	21 00	28 00

With 3 feet of Hose and Discharge Pipe.

Fig. 126, Foot Valve with Strainer, suitable for pipe 1¼ inch caliber.....	$2 50

RUMSEY'S PATENT ENGINE WELL PUMP,

ARRANGED WITH BRAKES FOR WOOD LEVERS.

Fig. 273.

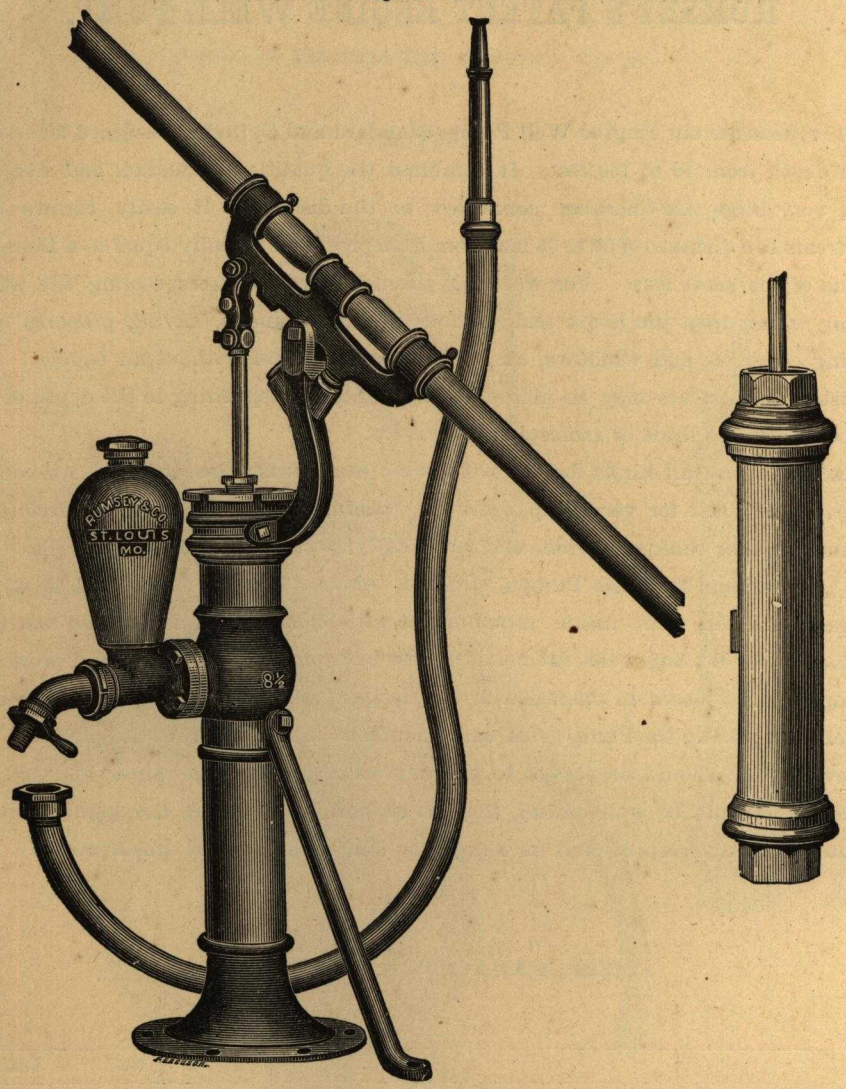


Fig. 273 shows our Engine Well Pump Standard and Cylinder, for Wells up to 150 feet in depth. It is similar to Fig. 118, but arranged with brakes with hard wood levers, making it doubly effective in case of fire, more power being obtained, and a stream thrown to a greater distance. It is adapted not only for fire protection, but for all ordinary uses of a well pump. The description of Fig. 118, given on page 553, equally applies to this Pump.

DIRECTIONS.

When used as a common Pump, the nut on the top of air chamber should be unscrewed two or three turns; when used with hose, the nut should be screwed down perfectly tight.

No. 8½, 3 inch cylinder, capacity per stroke 0.10 gallon, for 1½ inch pipe, with three feet of hose and discharge pipe.....	Iron, Cylinder,	$22 00
	Brass Cylinder,	28 00

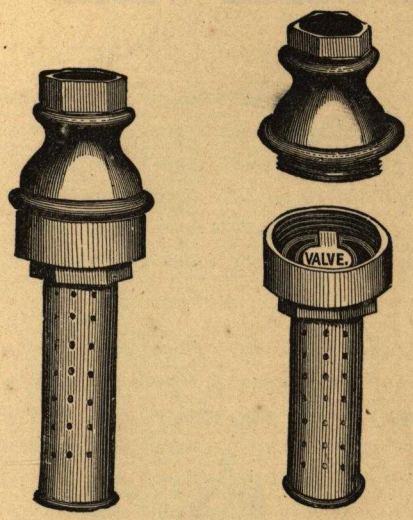
Above prices include Cylinder.

Fig. 126, Foot Valve with Strainer, suitable for pipe 1¼ inch caliber.....	$2 50

For prices on all kinds of Cylinders, see pages 558 and 559.

IMPROVED FOOT VALVE, WITH STRAINER ATTACHED.

Fig. 126. **Fig. 266.** **Fig. 265.**



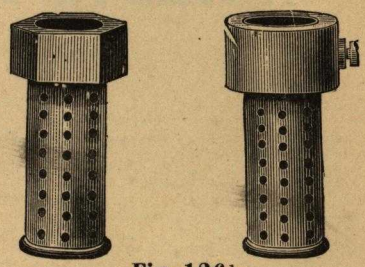


Fig. 126½.
COVERED WITH GAUZE.

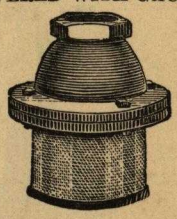


Fig. 126 shows our improved Foot Valve and Strainer, designed for attaching to the lower end of Suction Pipes, to relieve the upper working valves of the weight of the column of water when the Pump is not in use. This Valve being at the bottom, not only prevents the water from passing back, but forms a support for that in the suction pipe, keeping it constantly so near the piston that the Pump cannot fail in perfect operation under ordinary circumstances. These Valves are made in the most workmanlike manner and are guaranteed equal to any made in every respect. We recommend using them with all Pumps, either for hand or power, except where the Cylinder is at the bottom of the well, as they will save much trouble and expense in repairing valves, priming pumps, etc. We keep ten sizes in stock, fitted for the standard gauge of wrought iron pipe, as follows, viz:

SIZES AND PRICES.

Fig. 126, No. 1, Fitted for Wrought Iron Pipe, 1 inch Caliber, each	$ 2 00
Fig. 126, No. 2, Fitted for Wrought Iron Pipe, 1¼ inch Caliber, each	2 25
Fig. 126, No. 3, Fitted for Wrought Iron Pipe, 1½ inch Caliber, each	2 50
Fig. 126, No. 4, Fitted for Wrought Iron Pipe, 2 inch Caliber, each	3 00
Fig. 126, No. 5, Fitted for Wrought Iron Pipe, 2½ inch Caliber, each	3 50
Fig. 126, No. 6, Fitted for Wrought Iron Pipe, 3 inch Caliber, each	4 50
Fig. 126, No. 7, Fitted for Wrought Iron Pipe, 3½ inch Caliber, each	5 00
Fig. 126, No. 8, Fitted for Wrought Iron Pipe, 4 inch Caliber, each	6 00
Fig. 126, No. 9, Fitted for Wrought Iron Pipe, 5 inch Caliber, each	8 00
Fig. 126, No. 10, Fitted for Wrought Iron Pipe, 6 inch Caliber, each	10 00

Fig. 266 represents a Strainer threaded for ordinary sizes of gas pipe.

Sizes and Prices—1, 1¼ and 1½ inch	$ 0 35
Sizes and Prices—2 and 2½ inch	0 50

Fig. 265 represents a Strainer made large at the end to slip on over the pipe, and is held in place by a set screw, as shown in cut.

Sizes and Prices—1, 1¼ and 1½ inch	$ 0 35

CYLINDERS FOR DUG OR DRILLED WELLS.

FROM 10 TO 200 FEET IN DEPTH.

Fig. 257.

Fig. 124.

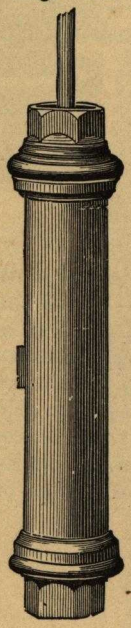


Fig. 124½.

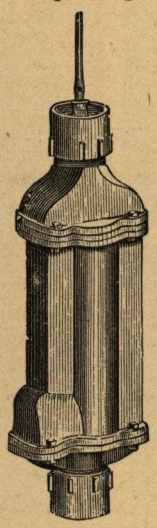


Fig. 125.

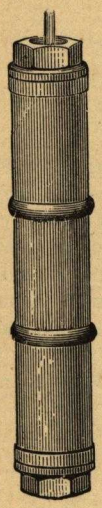


Fig. 128.

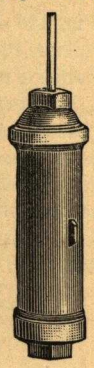


Fig. 123 represents our shallow-well Cylinders. They have brass valve seats, 7½-inch stroke.

Fig. 124 represents deep-well Cylinder, metallic plunger, with brass plunger top, brass poppet valve and brass valve seats, outside attachments.

Fig. 124½ represents double-acting Cylinder.

Fig. 125 represents our drilled deep-well Cylinders, with inside attachments, smooth joints, brass plunger-top and valve, and brass valve seats.

Fig. 257 is our drilled Artesian-well Cylinder, with outside attachments, long plunger, brass top, brass valve, brass valve seat. We make two lengths, 16 and 18 inch, stroke 9 and 12 inch.

For sizes and prices, see opposite page.

SIZES AND PRICES OF DEEP AND SHALLOW WELL CYLINDERS.

CYLINDERS FOR SHALLOW WELLS, WITH BRASS VALVE SEATS, IRON ATTACHMENTS.

Fig. 123.

	Iron
Inside Diameter 2 inch, Length of Shell or Body of Cylinder 9 inch	$ 3 25
Inside Diameter 2¼ inch, Length of Shell or Body of Cylinder 9 inch	3 25
Inside Diameter 2½ inch, Length of Shell or Body of Cylinder 9 inch	3 50
Inside Diameter 2¾ inch, Length of Shell or Body of Cylinder 9 inch	3 75
Inside Diameter 3 inch, Length of Shell or Body of Cylinder 9 inch	4 00
Inside Diameter 3¼ inch, Length of Shell or Body of Cylinder 9 inch	4 25

	Iron.	Brass.
Inside Diameter 2 inch, Length of Shell or Body of Cylinder 10½ inch	$ 3 50	$ 6 00
Inside Diameter 2¼ inch, Length of Shell or Body of Cylinder 10½ inch	3 75	6 50
Inside Diameter 2½ inch, Length of Shell or Body of Cylinder 10½ inch	4 00	7 00
Inside Diameter 2¾ inch, Length of Shell or Body of Cylinder 10½ inch	4 25	7 50
Inside Diameter 3 inch, Length of Shell or Body of Cylinder 10½ inch	4 50	8 00
Inside Diameter 3¼ inch, Length of Shell or Body of Cylinder 10½ inch	5 00	8 50

We make all sizes of the above Cylinders of the Bolted patterns, when so ordered.

DEEP WELL CYLINDERS, WITH BRASS VALVE SEATS, IRON ATTACHMENTS.

Figs. 124, 125 and 257.

	Iron.	Brass.
Inside Diameter 2 inch, Length of Shell or Body of Cylinder 16 inch	$ 6 00	$ 9 00
Inside Diameter 2¼ inch, Length of Shell or Body of Cylinder 16 inch	6 50	9 50
Inside Diameter 2½ inch, Length of Shell or Body of Cylinder 16 inch	7 00	10 00
Inside Diameter 2¾ inch, Length of Shell or Body of Cylinder 16 inch	7 50	10 50
Inside Diameter 3 inch, Length of Shell or Body of Cylinder 16 inch	8 00	11 00
Inside Diameter 3¼ inch, Length of Shell or Body of Cylinder 16 inch	8 50	11 25
Inside Diameter 3½ inch, Length of Shell or Body of Cylinder 16 inch	9 00	11 50
Inside Diameter 3¾ inch, Length of Shell or Body of Cylinder 16 inch	9 25	12 00
Inside Diameter 4 inch, Length of Shell or Body of Cylinder 16 inch	9 50	14 00
Inside Diameter 4½ inch, Length of Shell or Body of Cylinder 16 inch	10 50	16 00
Inside Diameter 5 inch, Length of Shell or Body of Cylinder 16 inch	14 00	20 00
Fig. 124½, Double Acting Cylinder 3 inch, 1½ and 2 inch pipe	12 00	18 00

We make all the above with flush joints, when so ordered, at same prices.

	Iron.	Brass.
Inside Diameter 2 inch, Length of Shell or Body of Cylinder 18 inch	$ 7 00	$ 9 50
Inside Diameter 2¼ inch, Length of Shell or Body of Cylinder 18 inch	7 50	10 00
Inside Diameter 2½ inch, Length of Shell or Body of Cylinder 18 inch	8 00	10 50
Inside Diameter 2¾ inch, Length of Shell or Body of Cylinder 18 inch	8 50	11 00
Inside Diameter 3 inch, Length of Shell or Body of Cylinder 18 inch	9 00	11 50
Inside Diameter 3½ inch, Length of Shell or Body of Cylinder 18 inch	9 50	12 00
Inside Diameter 3¾ inch, Length of Shell or Body of Cylinder 18 inch	10 00	13 00
Inside Diameter 4 inch, Length of Shell or Body of Cylinder 18 inch	10 50	14 00
Inside Diameter 5 inch, Length of Shell or Body of Cylinder 18 inch	15 00	21 00

All the above are made with flush joints. All the above sizes of Cylinders are made in Brass when so ordered. Add $2.00 extra to above prices for Brass Cylinders with Brass attachments. We make many other sizes of Cylinders not enumerated above.

DEEP WELL FORCE PUMP,

FOR DUG WELLS OF ANY DEPTH, AND BUILDINGS OF MANY STORIES.

Fig. 128.

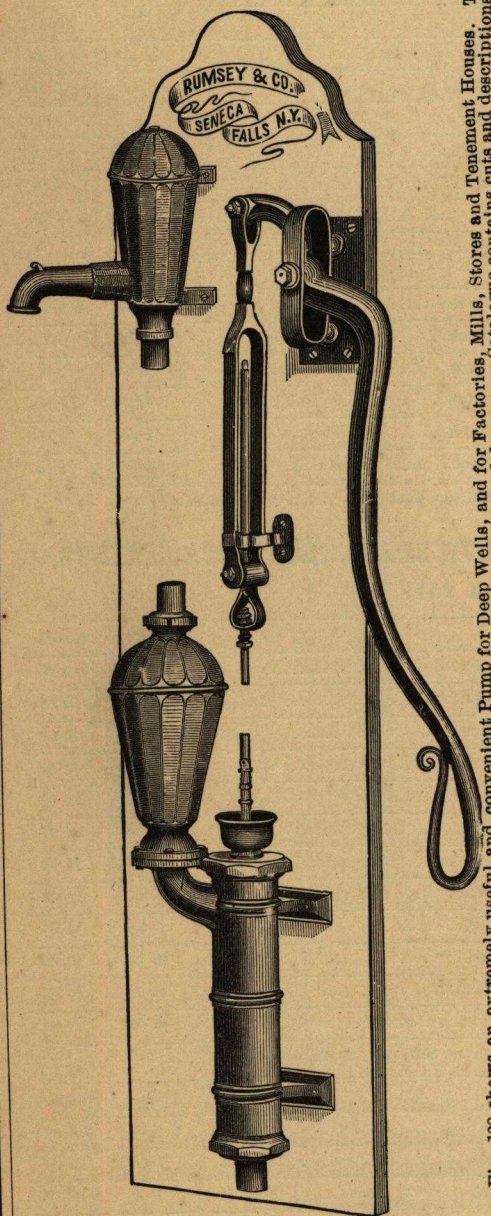
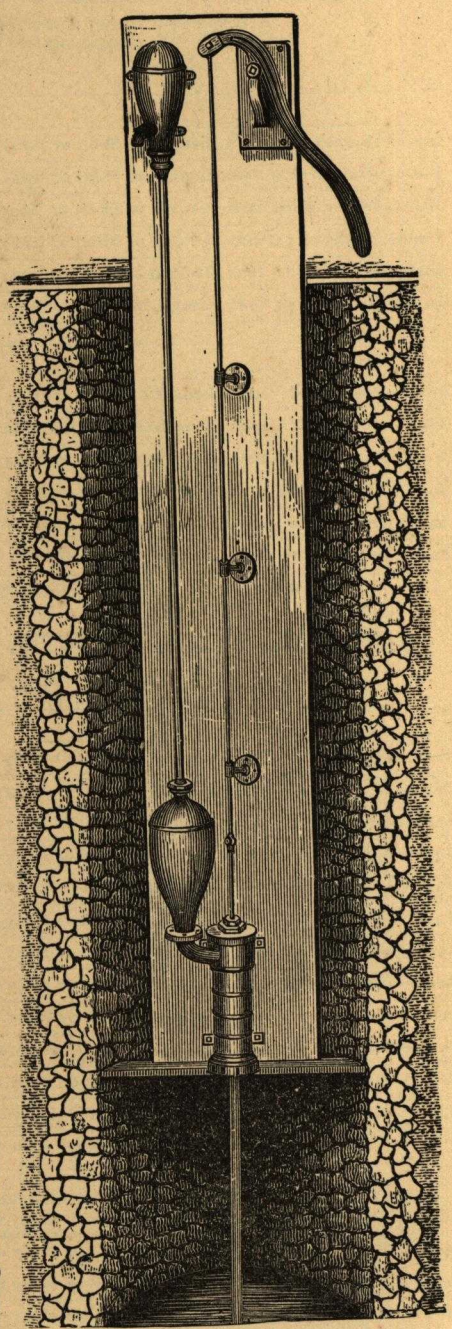


Fig. 128 shows an extremely useful and convenient Pump for Deep Wells, and for Factories, Mills, Stores and Tenement Houses. The many purposes for which it is adapted require some particular notice. For dug wells, out of doors, our Catalogue contains cuts and descriptions of other Force Pumps of new designs which excel it; but if the well is under the building, and too deep for the ordinary House Force Pump, we know of none in the market better than Fig. 128, and for Mills, Seminaries, etc., where water is wanted in each room and on every floor, it cannot be surpassed. This Pump can be set in the basement, with lever and upper air chamber on the topmost floor of the building, and the discharge pipe running through all the floors, with stop-cock or bibb connection and auxiliary lever attached to the working rod on each floor; thus making it equal to as many Pumps as there are floors, and economizing space, labor and money. It is fitted with solid Brass Rod, Brass Three extra rod-guides go with each Pump.

Fig. 127 shows the manner of setting up Fig. 128. Use Foot Valve, Fig. 126, on Suction Pipe. Stuffing-box and Brass Valve Seat, and is arranged for either lead or iron pipe.

Fig. 127.



Sectional View of Dug Well and Deep Well Force Pump.

SIZES, CAPACITY AND PRICES OF FIG. 128.

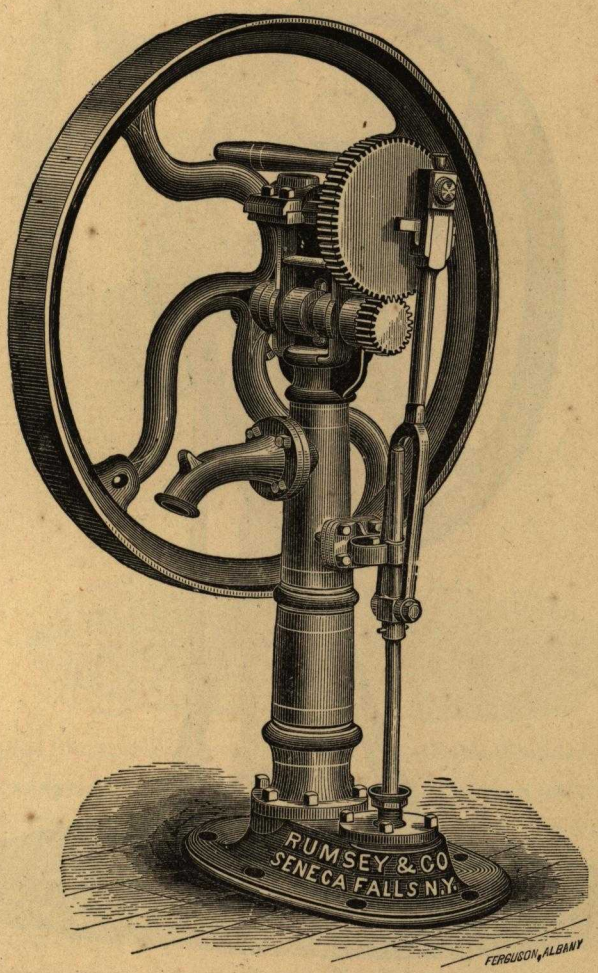
No. 6, 2	inch cylinder, 0.045 gallon capacity per stroke, for 1 inch pipe, each	$16 00
No. 6, 2½	inch cylinder, 0.08 gallon capacity per stroke, for 1¼ inch pipe, each	17 00
No. 6, 3	inch cylinder, 0.125 gallon capacity per stroke, for 1¼ inch pipe, each	18 00
No. 6, 4	inch cylinder, 0.22 gallon capacity per stroke, for 1½ or 2 inch pipe, each	24 00

For prices of Foot Valve with Strainer, see Fig. 126, page 557.

STRONG GEARED DEEP-WELL STANDARD, OR COLUMN FORCE PUMP,

WITH HEAVY FLY-WHEEL, CRANK-PLATE, BRONZE ROD, ETC.

Fig. 300.



The above Pump is an exceedingly powerful arrangement, and easy of operation, being geared with the power of three to one, to which is added a very heavy balance-wheel, for the elevation of water from deep wells, or conveying it long distances. The substantial appearance of the cut is no exaggeration, but only a good representation of our Standard. It can be worked by hand or power. The band-wheel is of sufficient diameter, weight and width of face for the work required to be done, as it is proportioned to the work in each case. A flange can be attached instead of the spout, if desired. An air-chamber can be used in place of either, similar to Fig. 303. It has a wrought-iron Pitman, with gib and key connection, Bronze Rod and Gland. Always fitted for 1½-inch pipe, unless otherwise ordered.

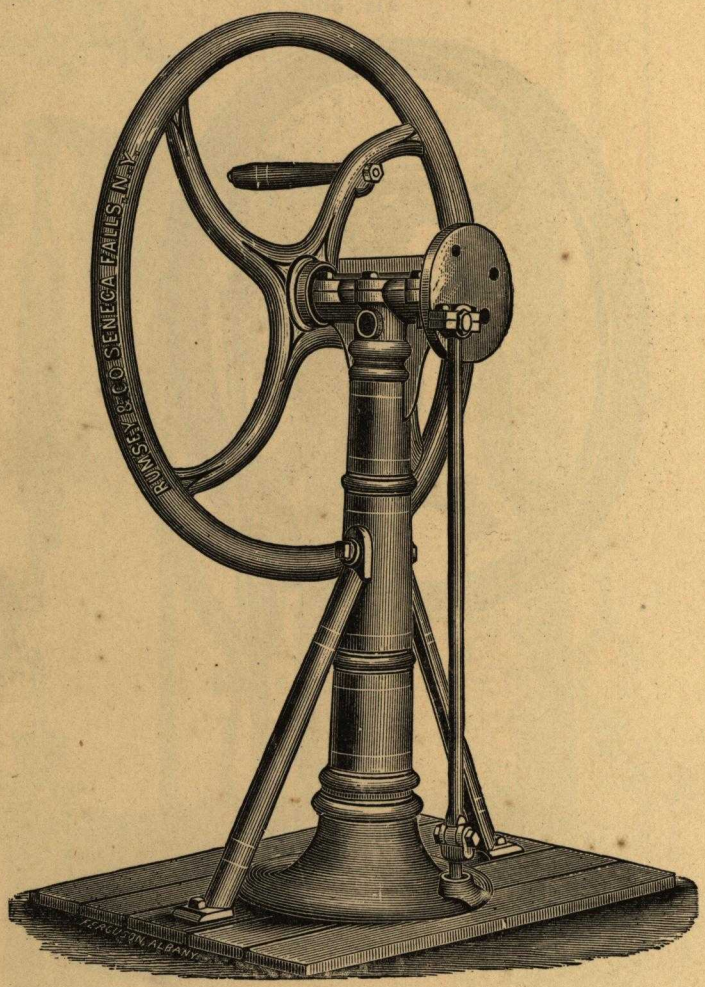
Fig. 300, Standard complete, as per cut, 8-inch stroke, without cylinder	$65 00
Fig. 300, Standard complete, as per cut, 8-inch stroke, with air chamber, without cylinder	68 00

See pages 558 and 559 for Cylinders to go with this Standard. See page 557 for prices on Foot Valves with Strainers.

STRONG COLUMN, FOR DEEP WELLS.

DOUBLE BRACED, WITH CRANK PLATE, AND SHAFT IN LONG BEARING.

Fig. 301.



The above cut represents a particularly useful arrangement for operating Pump Cylinders in wells of any depth. The crank plate is so arranged that the stroke may be changed to suit any particular case. The Pump rod-head is so constructed that lost motion from wear of wrist-pin can be taken up without the assistance of a skilled mechanic. The Crank Shaft is 1⅝ inches diameter, and works in a white-metal box, 10½ inches long. This column is adapted for use in connection with any of our single-acting Cylinders from 2 inches to 5 inches diameter. See pages 558 and 559 for prices of Cylinders.

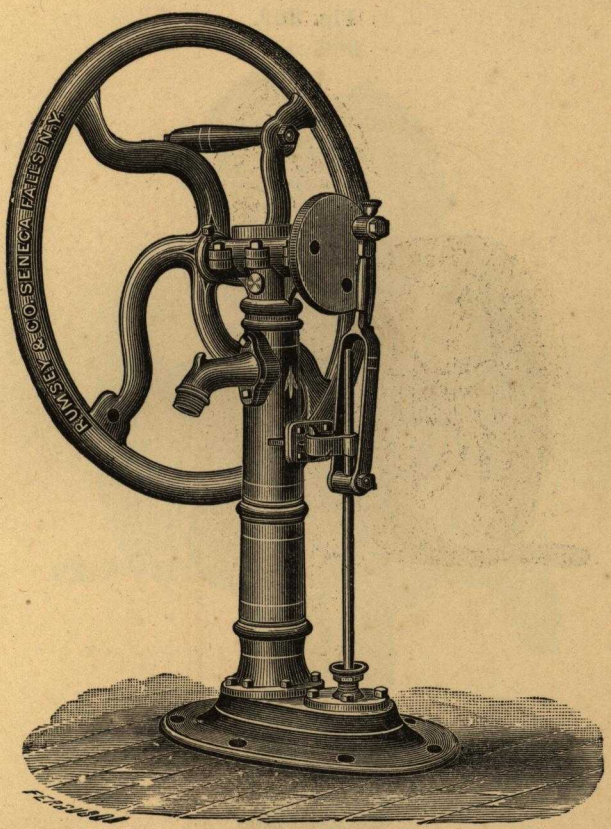
Fig. 301—Price, complete, as per cut, without Cylinder..... $50 00

For prices of Foot Valves, with Strainers, see page 557.

EXTRA STRONG DEEP WELL STANDARD, OR COLUMN FORCE PUMP,

WITH HEAVY BALANCE WHEEL, BRONZE ROD, WROUGHT PITMAN AND CRANK.

Fig. 302.



The accompanying cut illustrates our newly devised Force Pump Standard, for use on deep wells. The cut represents it adapted for hand. When ordered for power, a pulley balance wheel is put on, like that shown in Fig. 300. This Standard is so arranged that the water is conducted from the pipe to the column, and is discharged through the spout—or, if desired, into a discharge pipe—and carried to any point required, however distant or elevated. An air-chamber can be attached, similar to Fig. 303, at a reasonable price, instead of either spout or pipe, or combined with either, which will convert it into an efficient Fire Engine.

It has a wrought iron Pitman, Bronze Rod, with a strong guide to keep the rod always in a vertical position.

SIZES AND PRICES.

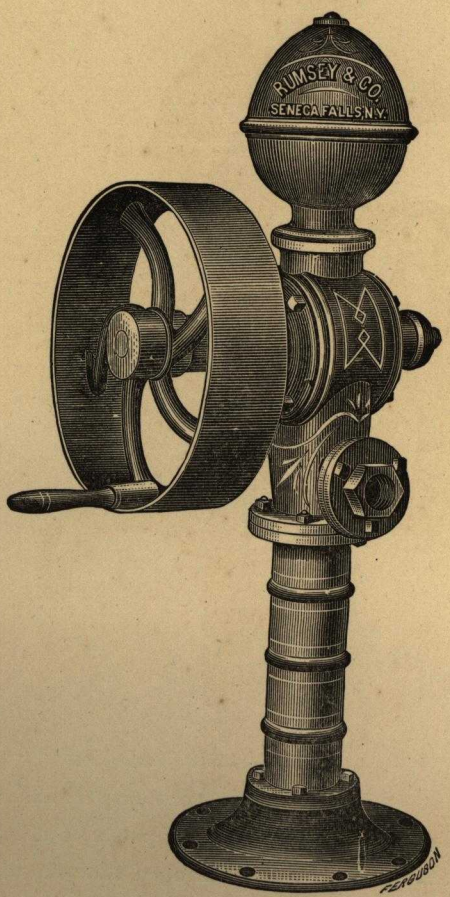
No. 1, with crank for 5 inch to 8 inch stroke	$35 00
No. 2, with crank for 5 inch to 8 inch stroke, extra heavy	46 00
No. 1, with crank for 5 inch to 8 inch stroke, Pulley and Fly-Wheel	41 00
No. 2, with crank for 5 inch to 8 inch stroke, Pulley and Fly-Wheel, extra heavy	52 00

Above prices are without Cylinder. Always cut for 1¼ inch pipe, unless otherwise ordered. See pages 558 and 559 for Cylinders to go with this Standard, from 2 inch to 5 inch diameter, either single or double action. For prices of Foot Valve and Strainers, see page 557. For prices of Cylinders, see pages 558 and 559.

RECIPROCATING POWER PISTON PUMP,

WITH CRANK SHAFT, PULLEY AND BALANCE WHEEL, FOR HAND OR POWER.

Fig. 309.



This is similar to Fig. 303, less the Air-Chamber on Spout. It is a very compact, powerful and durable Suction and Force Pump, for raising water from wells, cisterns, etc., by hand or power, and forcing it into tanks, boilers, or any other elevated position required. It is a Crank Piston Pump, built and fitted with the utmost care throughout, combining simplicity, easy handling and effective work, and we can safely say has given more general satisfaction than any Pump of the kind heretofore manufactured.

SIZES AND PRICES.

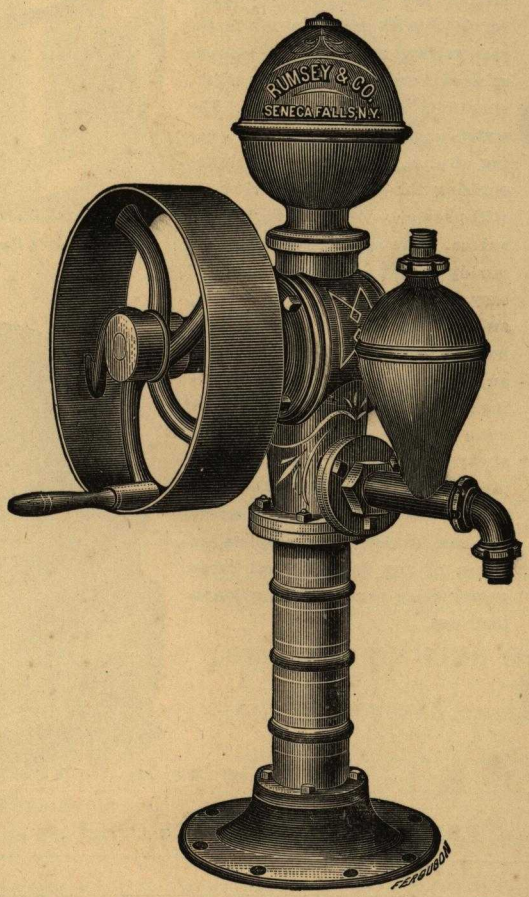
No. 1, 3 inch Cylinder, for 1¼ inch pipe, without Cylinder	$25 00
No. 2, 3⅛ inch Cylinder, for 1½ inch pipe, without Cylinder	32 00

When used in wells more than 10 feet in depth, we advise the use of Foot Valve, Fig. 126; see page 557. For price of Cylinders to go with this Pump, see pages 558 and 559.

RECIPROCATING POWER PISTON PUMP,

WITH AIR CHAMBER, FOR HAND OR POWER.

Fig. 303.



This is one of the best devices for raising water from wells, cisterns, etc., yet put upon the market. It is a hand or power Pump. The crank and shaft are made of cast steel, and all parts are fitted with special tools. Exact duplicates of any parts are always kept in stock, and orders for the same can be promptly filled. We make this Pump with or without the air-chamber on the spout, to suit customers. We, in most cases, advise its use, as it adds to the efficiency of the machine when used as a Force Pump.

SIZES AND PRICES.

No. 1, 3 inch Cylinder, for 1¼ inch pipe, with Air Chamber, without Cylinder	$27 00
No. 2, 3½ inch Cylinder, for 1½ inch pipe, with Air Chamber, without Cylinder	34 00

For Cylinders to go with this Pump, see pages 558 and 559. When used in wells of more than 10 feet in depth, we advise the use of our Foot Valve, Fig. 126. See page 557.

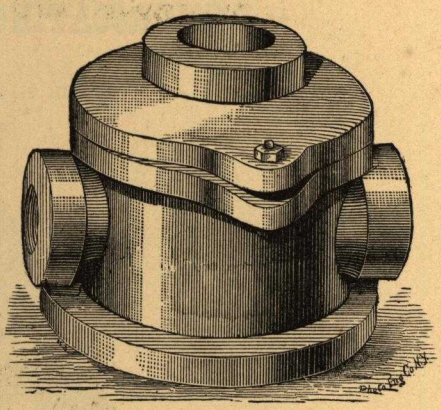
MINE CYLINDERS,

FOR MINES, QUARRIES AND DEEP WELLS.

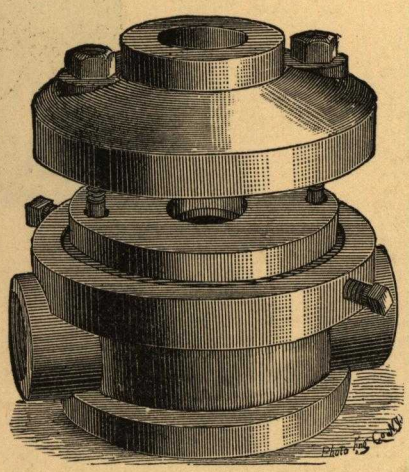
Fig. 174.

Fig. 174 shows our extra strong Cylinder for mine shafts, quarries, etc., of any depth, and is equally serviceable for general use in factories, railway stations, etc. It is unexceled in every respect for strength, simplicity and effectiveness. The water-ways are of full size of opening of pipe, so that any substance entering the Cylinder from below will pass out without clogging the valves. It is especially adapted for muddy water, as the valves are of easy access for cleaning or repairs, and the packing is so arranged as to be less affected by the mud than in any other pump. The Cylinder being placed at the very bottom of the mine shaft or well, the valves are always under water, and no suction pipe is required. We fit them for hand or machine power, as desired, and can furnish them complete for mines of any depth, in all cases guaranteeing perfect satisfaction in their use.

CASING HEADS.



(Armor's Patent, Sept. 29, 1874.)



(New Style.)

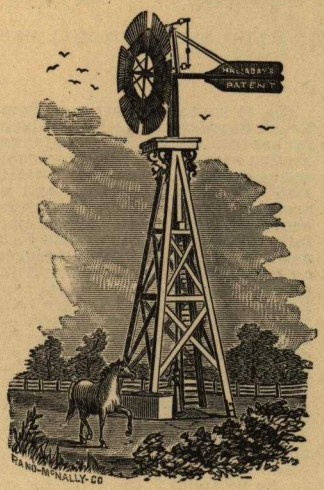
PRICE LIST CYLINDERS ONLY.

	Iron.	Brass.
No. 1, 4 inch cylinder, 14 inch stroke, capacity per stroke 0.35 gallon, for 2 inch pipe	$30 00	$68 00
No. 2, 5 inch cylinder, 14 inch stroke, capacity per stroke 0.55 gallon, for 2½ inch pipe	40 00	90 00
No. 3, 6 inch cylinder, 16 inch stroke, capacity per stroke 1.00 gallon, for 3 inch pipe	60 00	120 00
No. 4, 8 inch cylinder, 16 inch stroke, capacity per stroke 1.75 gallon, for 4 inch pipe	80 00	170 00
No. 5, 10 inch cylinder, 16 inch stroke, capacity per stroke 2.62 gallon, for 5 inch pipe	100 00	200 00
No. 6, 10 inch cylinder, 20 inch stroke, capacity per stroke 3.37 gallon, for 5 inch pipe	125 00	215 00
No. 7, 10 inch cylinder, 26 inch stroke, capacity per stroke 4.00 gallon, for 6 inch pipe	150 00	240 00

PRICE LIST CASING HEADS.

3¼ and 4¼ inch, each	$ 6 00
5⅝ inch round cast tops, 1 hole, each	7 00
5⅝ inch round cast tops, 2 holes, each	7 00
5⅝ inch new style, 1 hole, each	7 00
5⅝ inch new style, 2 holes, each	7 00
5⅝ inch for oil saver, each	7 00
5⅝ inch T casing head, each	10 00
5⅝ inch Armor's patent, each	30 00
5⅝ inch top for Armor's (complete), each	26 00
5⅝ inch rubber flanges for Armor's, each	4 00
5⅝ inch extra tops for common casing heads, each	2 00
Follower with bolts, "A. C." head, each	4 00
Flange for "A. C." heads, each	1 00
Set screws, each	30
Tubing rings for "C." heads, each	70
Pipe rings for "C." heads, each	30
Bottom for oil saver, each	5 00
Sand pump caps, each	2 50
Casing gas flanges—3¼, 75; 5⅝, each	2 00

HALLADAY STANDARD WIND MILLS.



PRICE LIST OF PUMPING WIND MILLS.

(FOR FARM AND ORNAMENTAL USE.)

No. 1, 8 feet diameter, weight 400 lbs	$ 75 00
No. 1½, 9 feet diameter, weight 440 lbs	80 00
No. 2, 10 feet diameter, weight 450 lbs	85 00
No. 3, 12 feet diameter, weight 750 lbs	115 00
No. 4, 13 feet diameter, weight 870 lbs	125 00

PRICE LIST OF LONG-STROKE WIND MILLS.

(ESPECIALLY ADAPTED TO TUBULAR WELLS.)

No. 2, 10 feet diameter, 10 inches stroke, weight 475 lbs	$ 90 00
No. 3, 12 feet diameter, 12 inches stroke, weight 775 lbs	125 00

Prices given for Wind Mills do not include any part of the Tower, Pump, Pipe or freight.

The table below shows the capacity of the first five sizes of our mills attached to such Pumps as are most suitable for the three elevations named. To obtain these results, the mills must be attached to the Pumps direct, and run at maximum speed. It is safe to calculate that our mills will produce these results seven or eight hours per day, on an average, through the year. For irrigation and drainage—where immense quantities of water are to be elevated—our larger sizes are the most suitable. These we arrange to work two or four lareg Pumps, according to the demand and the elevation to overcome.

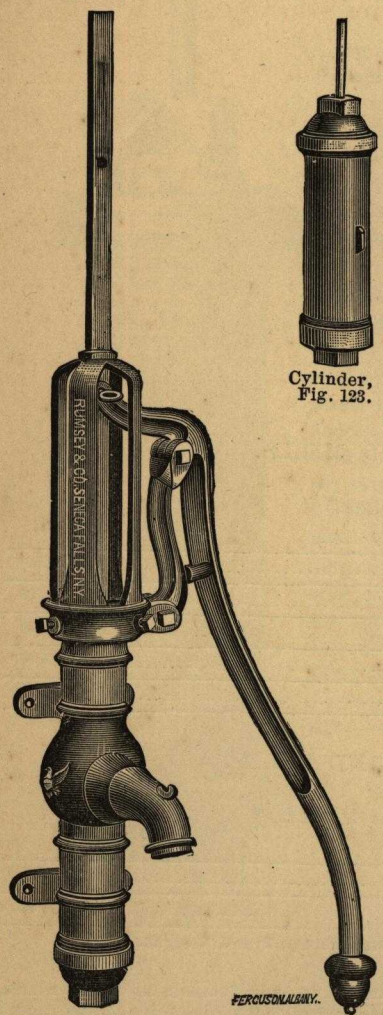
Diameter of Mill.	25 Feet Elevation.			50 Feet Elevation.			100 Feet Elevation.		
	Size Pump	Size Pipe.	No. Galls. per Hour.	Size Pump.	Size Pipe.	No. Galls per Hour.	Size Pump.	Size Pipe.	No. Galls. per Hour.
8 feet.	2½ s. a.	1¼	250	2 s. a.	1	150			
9 feet.	3 s. a.	1½	300	2¼ s. a.	1	200			
10 feet.	3½ s. a.	1½	500	3 s. a.	1½	350	2½ s. a.	1¼	200
12 feet.	3¾ s. a.	2	700	3½ s. a.	1½	550	3 s. a.	1½	300
13 feet.	5 s. a.	2½	1,000	3½ s. a.	1½	700	3 s. a.	1½	400

Always locate the mill directly over the well or source of supply, if there is no serious objection to it. If, however, it is impracticable to do this, it may be placed any distance away, and where the elevation from low-water-mark to the location selected does not exceed 30 feet, the pump may be placed in a frost-proof pit underneath the tower, and worked direct, same as if in the well with the mill directly over it.

RUMSEY'S "EAGLE" WIND MILL PUMP,

FOR HAND AND WIND MILL USE.

Fig. 54.



Cylinder, Fig. 123.

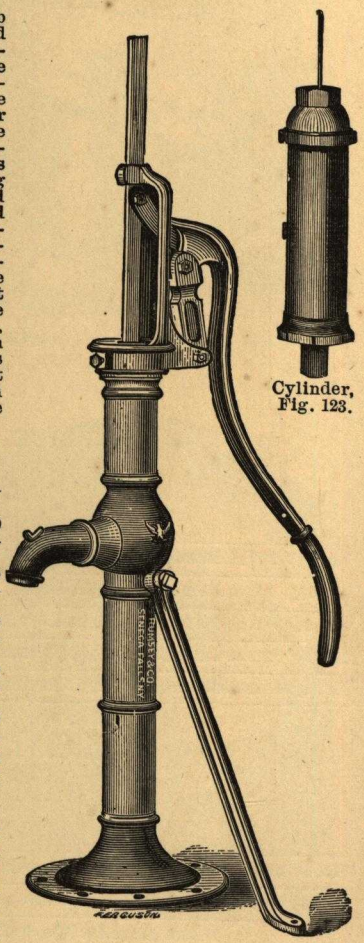
Fig. 54 represents our new Pump Top or Standard, especially designed for use with the Wind Engine in connection with either a single or double acting Cylinder. The device originated with a wind-mill man, and we are confident that no Pump has ever been offered to the trade that more fully meets the wants of this business. It is constructed with brackets on the back of the stock for bolting to the side of the tower or tank, and like all Pumps designed for Wind Mill use, has a flat piston-rod extending up through a guide to a sufficient distance to connect to the pitman-rod of the Mill or Engine; the Lever being connected to the flat piston-rod at a point below the guide for working the Pump by hand when, from any cause, the Mill is not in motion. The bottom of the stock is screwed for iron pipe for attachment to the Cylinder. The Cylinder can be placed at any depth commensurate with the power of the Engine.

PRICE.

Fig. 54, Wind Mill Head, on Bracket	$ 5 50
Iron Cylinder for Fig. 54, single action, Fig. 123, 3 inch	4 25
Brass Cylinder for Fig. 54. Fig. 123, 3 inch by 10½	8 00
Iron Deep Well Cylinder, 3 in by 16 in., Fig. 124	8 00
Brass Deep Well Cylinder, 3 in. by 16 in., Fig. 124	11 00

For prices on Cylinders, see pages 558 and 559. For prices on Foot Valves and Strainers, see page 557.

Fig. 283.



Cylinder, Fig. 123.

Fig. 283 illustrates our New and Improved Pump, designed especially for use with wind engines. It is made unusually strong and heavy, with long lever and brake. A rod attachment accompanies each pump, and also a rod coupling at the lower end of flat piston. It has a very substantial brace, holding it firmly when worked either by hand or power. This Pump is tapped immediately under the spout, preventing all possibility of bursting pump stock by freezing. We tap the Pump for all sizes of wrought iron pipe up to 2 inches caliber, but is always screwed for 1¼ inch, unless ordered differently. It combines the best elements of workmanship, utility and cheapness; all the parts are interchangeable, making it especially desirable for export. It is extensively used all over the country in connection with wind mills, and our correspondents at home and abroad give us unqualified assurances of its unrivaled utility in this capacity. We shall be pleased to answer any communications regarding Mills or Pumps.

SIZES AND PRICES OF FIG. 283.

Fig. 283, No. 31, Height from Base to Spout, 19 inches, with 3 in. by 9 in. Iron Cylinder, Fig. 123	$12 25
Fig. 283, No. 32, Height from Base to Spout, 23½ inches, with 3¼ in. by 10½ in. Iron Cylinder, Fig. 123	13 50
Fig. 283, No. 33, Height from Base to Spout, 25 inches, with 3 in. by 12 in. Iron Cylinder, Fig. 123	14 50
Fig. 283, No. 7, Extra Large Size, 3 in. by 16 in. Iron Cylinder, Fig. 124	18 00

When Cylinders are not taken, we deduct as follows:

Cylinder for No. 31	$4 25
Cylinder for No. 32	5 00
Cylinder for No. 33	5 50
Cylinder for No. 7	8 00

For Price of Foot Valves, with Strainers, see page 557. For prices on Brass and Iron Cylinders, see pages 558 and 559.

"EAGLE" WIND MILL PUMP STANDARD,

FOR DEEP WELLS.

Fig. 284.

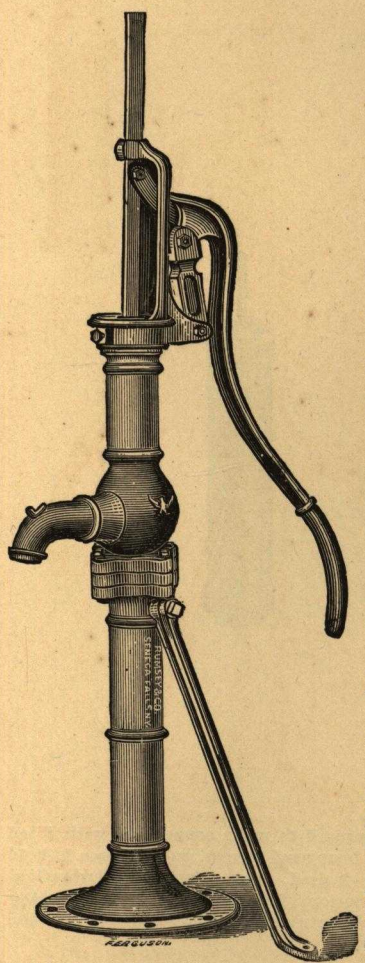


Fig. 284 represents our New and Improved Sectional Standard for use with Wind Engines. As shown, it can be taken apart below the spout—a decided convenience when wishing to change the Pump for a different size of pipe. The nut or flange between the two sections is six-sided, and accurately fitted into the lower part of the Standard. These flanges are all of a size and drilled exactly alike, so that they will interchange, and are screwed for different sizes of pipe up to and including 2¼ inch, so that by having an assortment of extra flanges, the same Standard is suited for any of these sizes of pipe.

This Pump is especially adapted for use in wells from 50 to 150 feet deep, being strong, well braced and with long leverage. We build it for either a 6 or 10 inch stroke Cylinder, as ordered. For Cylinders to go with this Standard, see pages 558 and 559.

SIZES AND PRICES OF FIG. 284.

Standard, complete, as per cut, 6 in. stroke, without Cylinder....	$10 00
Standard, complete, as per cut, 10 in. stroke, without Cylinder....	11 50

EXTRA FLANGES.

For 1¼ inch, each.....	0 50
For 1½ or 2 inch, each..	0 60

For prices of Foot Valves with Strainers, see page 557. For prices on Cylinders for above Pump, see pages 558 and 559.

"EAGLE" WIND MILL FORCE PUMP STANDARD,

FOR DEEP WELLS.

Fig. 286.

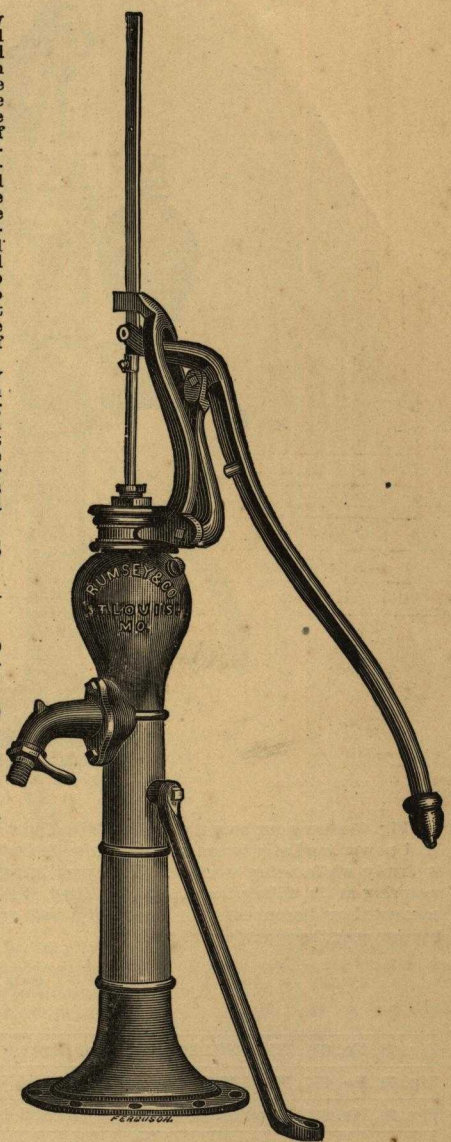


Fig. 286 represents our Anti-Freezing Engine Well Force Pump Standard, in an improved form, being especially adapted for use with Wind Mills. The air chamber is combined in the Standard, instead of being placed on the discharge. This Pump can be used on wells of any depth up to 200 feet. It combines the principles of atmospheric pressure or suction, with the Force Pump. Hose can be easily connected, and it is readily converted into a very efficient Fire Engine, or adapted to the many uses for which a first-class Force Pump is usually designed. We tap it to receive the gas pipe just below the spout.

SIZES AND PRICES OF FIG. 286.

Fig. 286, complete, as per cut, 6 inch stroke, without Cylinder.....	$10 00
Fig. 286, complete, 10 inch stroke, without Cylinder.....	11 50
Add to list price for Cocks.....	2 50

See pages 558 and 559 for Cylinders to go with this Standard. For price of Foot Valves with Strainers, see page 557.

"EAGLE" WIND-MILL FORCE PUMP, WITH BRACE.

Fig. 68.

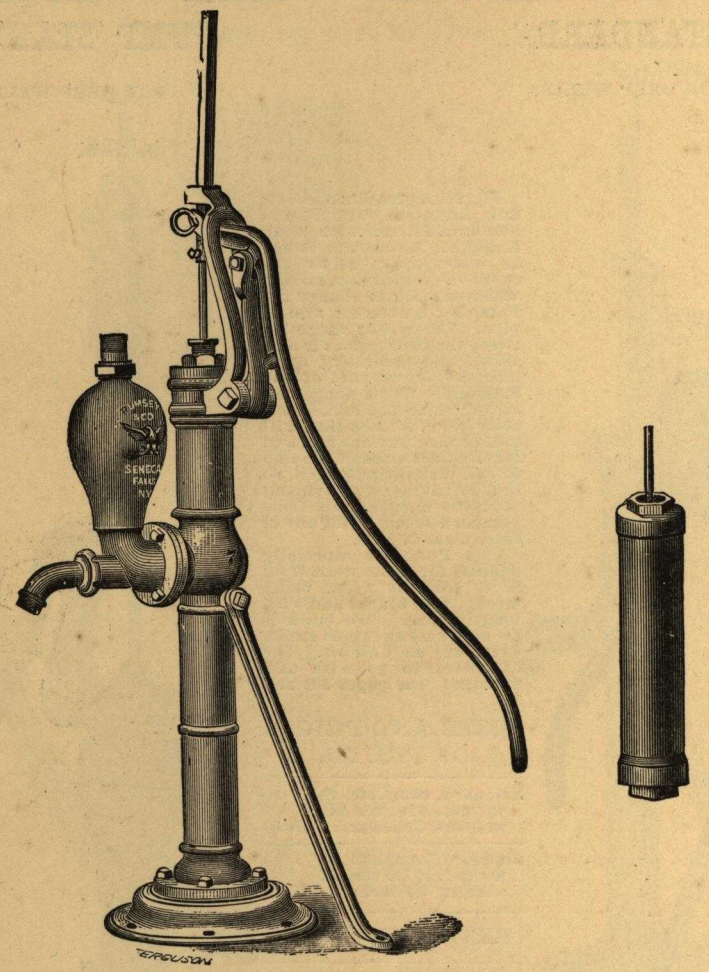


Fig. 68 shows our new style Wind Mill Force Pump Standard, with Top arranged to make connection with Wind Mill power, and also to use by hand when desired. The entire Pump is made heavy and strong, with a brace to hold it firmly while being worked. The Spout is arranged for attaching hose, if desired. For purposes of irrigation, watering stock, filling tanks, etc., by Wind Mill power, this Pump has no superior. The lever or handle is readily connected or disconnected by means of a bolt or pin. These Pumps are tapped to receive the gas pipe either at the base or near the spout, as ordered.

SIZES AND PRICES.

Fig. 68, No. 6½, Wind Mill Standard, and 3 inch by 9 inch iron Cylinder (Fig. 123)	$14 25
Fig. 68, No. 7½, Wind Mill Standard, and 3 inch by 10½ inch iron Cylinder (Fig. 123)	17 00
Fig. 68, No. 8½, Wind Mill Standard, and 3 inch by 16 inch iron Cylinder (Fig. 124)	22 00

For prices of Iron and Brass Cylinders, see pages 558 and 559.

WHEN CYLINDERS ARE NOT TAKEN, WE DEDUCT AS FOLLOWS:

Cylinder for No. 6½ Standard	$4 25
Cylinder for No. 7½ Standard	5 00
Cylinder for No. 8½ Standard	7 00
For Iron Cock, with Brass Plug, add to list price on Nos. 6½ and 7½	2 50
For Iron Cock, with Brass Plug, add to list price on No. 8½	3 00

For prices of Foot Valves, with Strainers, see page 557.

"EAGLE" WIND MILL FORCE PUMP,

FOR HAND AND WIND MILL USE.

Fig. 285.

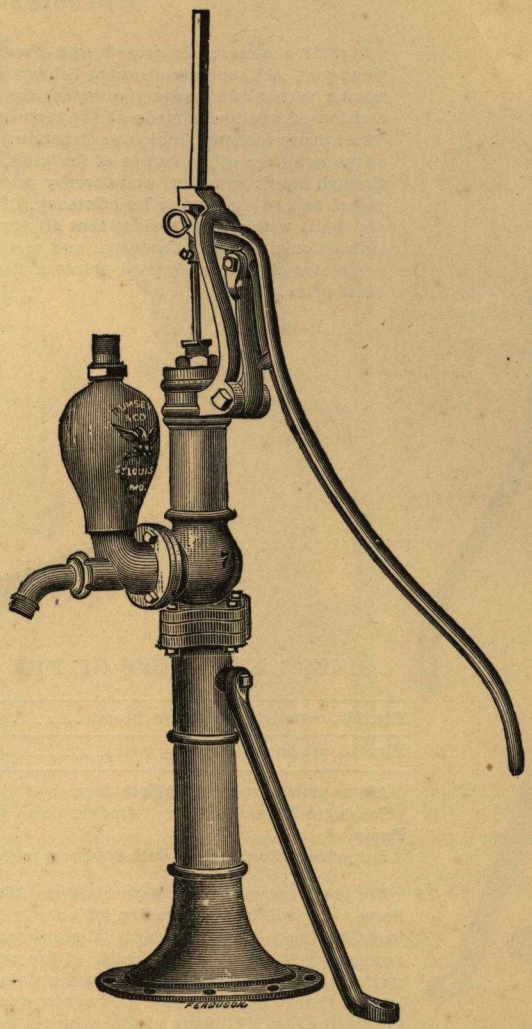


Fig. 285 shows a Standard built in two sections, similar to Fig. 284, but arranged as a Force Pump, with air chamber, and can be worked by either hand or power, as circumstances require. The improvement in this Pump over ordinary Engine Well Pumps will be seen at a glance, as the intermediate flange can be instantly changed for any size of pipe up to and including 2 inch. The same sized flanges are used in Figs. 284 and 285, and we can safely recommend both these Pumps as being unsurpassed in convenience and utility. We build them for 6 or 10 inch stroke Cylinders. For Cylinders to go with this Standard, see pages 558 and 559.

SIZES AND PRICES.

Standard, complete, as per cut, 6 inch stroke, without Cylinder	$13 50
Standard, complete, as per cut, 10 inch stroke, without Cylinder	15 00

EXTRA FLANGES.

For 1¼ inch, each	$ 0 50
For 1½, 2 and 2½ inch, each	0 60

For prices of Iron and Brass Cylinders for above Pump, see pages 558 and 559. For price of Foot Valves with Strainers, see page 557.

IMPROVED HAND AND WIND MILL FORCE PUMP.

Fig. 288.

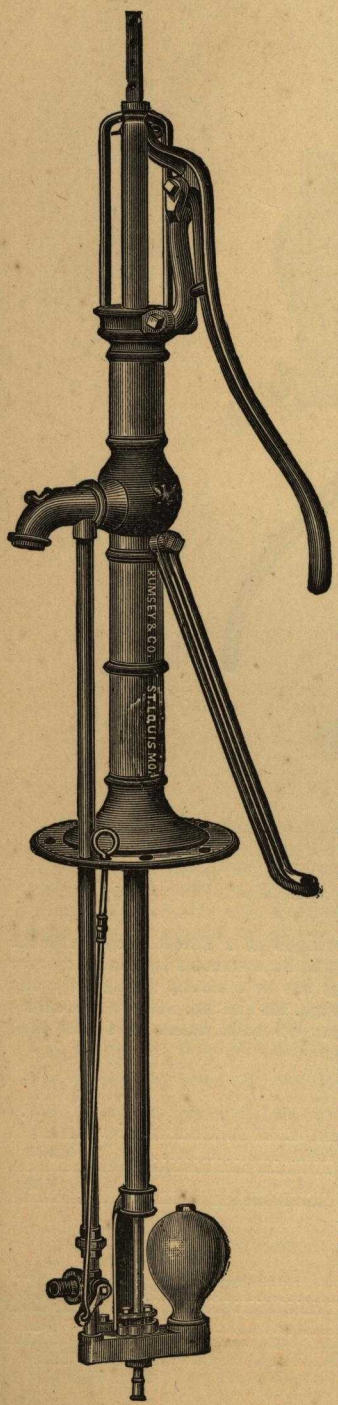


Fig. 288 shows our Improved Anti-Freezing Wind Mill Force Pump, with three-way cock, and air-chamber below the platform. By our new improvement a vertical discharge pipe enters the spout for all ordinary uses, while a union connection is made at the three-way cock for horizontal pipe to force water to any distance and in any direction. This device possesses a very decided advantage over other Pumps of the kind, as the piston rod does not work through the air-chamber, and thereby prevents the danger of exhausting that vessel and so destroying its efficiency. These Pumps are made anti-freezing and built with special tools so that all parts will interchange. They are well proportioned, tasteful in design and of the best material and workmanship—combining all the really good points of the best Pumps of the class at a moderate price.

SIZES AND PRICES OF FIG. 288.

Fig. 288, complete, as shown in cut.....	$18 00
Fig. 288, without three-way cock.....	16 00

Above prices are without Cylinders.

See pages 558 and 559 for Cylinders to go with this Pump.

For price of Foot Valves with Strainers, see page 557.

NEW STYLE WIND MILL FORCE PUMP,

WITH THREE-WAY COCK; ANTI-FREEZING.

Fig. 289.

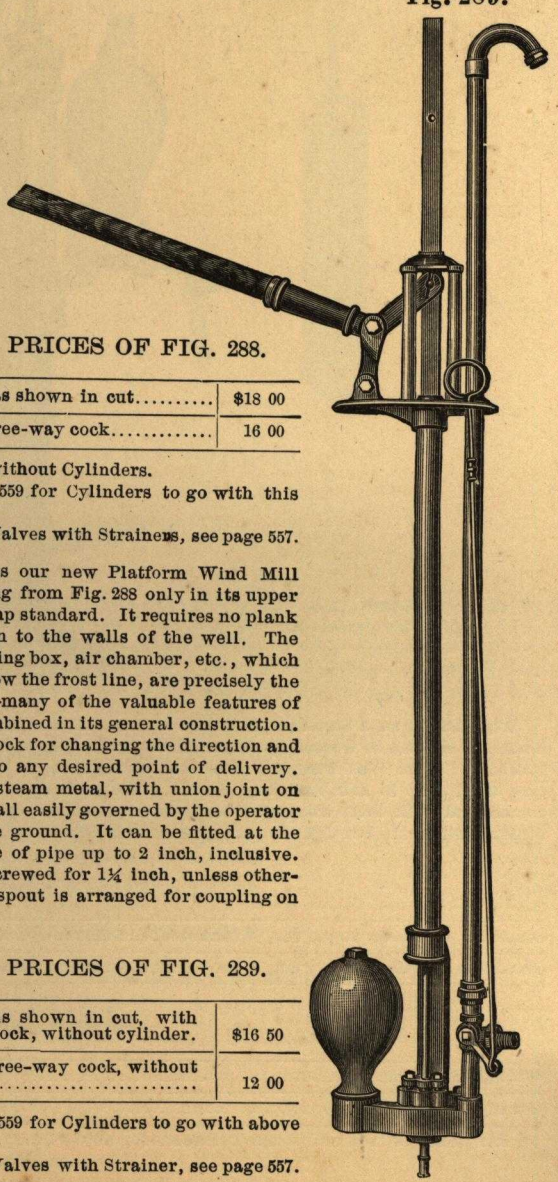


Fig. 289 represents our new Platform Wind Mill Force Pump, differing from Fig. 288 only in its upper parts, having no pump standard. It requires no plank or masonry to fasten to the walls of the well. The working parts, packing box, air chamber, etc., which hang in the well below the frost line, are precisely the same as in Fig. 288—many of the valuable features of that Pump being combined in its general construction. It has a three-way cock for changing the direction and forcing the water to any desired point of delivery. The cock is of best steam metal, with union joint on horizontal pipe, and all easily governed by the operator at the surface of the ground. It can be fitted at the bottom for any size of pipe up to 2 inch, inclusive. We always send it screwed for 1¼ inch, unless otherwise ordered. The spout is arranged for coupling on hose, when desired.

SIZES AND PRICES OF FIG. 289.

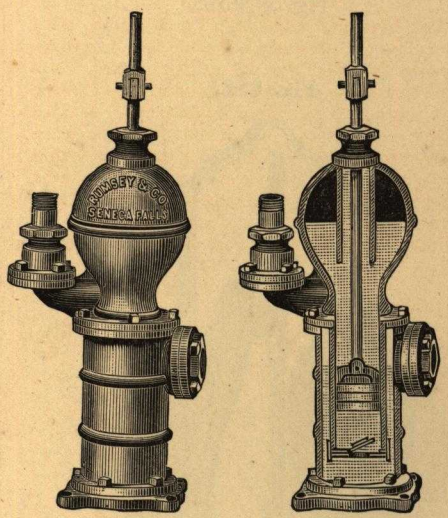
Fig. 289, complete, as shown in cut, with 1 inch three-way cock, without cylinder.	$16 50
Fig. 289, without three-way cock, without cylinder.....	12 00

See pages 558 and 559 for Cylinders to go with above Pump.

For price of Foot Valves with Strainer, see page 557.

WIND MILL FORCE PUMP, "TOM THUMB."

Fig. 287.



WIND MILL TANK FORCE PUMP,

WITH AIR CHAMBER.

Fig. 62.

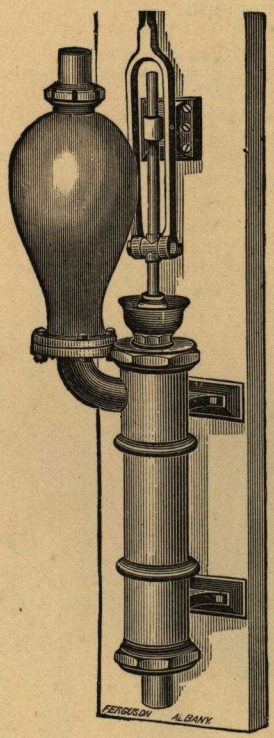


Fig. 256.

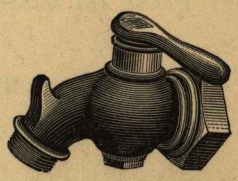


Fig. 256 represents an Iron Cock with Brass Plug, of which we make two sizes, as follows:

SIZES AND PRICES.

No. 1 Cock, for the smaller sizes of our House and Force Pumps, with thread cut for 1-inch hose coupling.....	$2 50
No. 2 Cock, made with threads for 1¼-inch hose coupling, and designed for larger sized Pumps.....	3 00

Fig. 287 serves to illustrate a working barrel for deep or shallow wells. It is constructed with two cylinders, one placed within the other, leaving a space of one inch or less between them for air and water. The piston works within the inner cylinder.

The suction pipe enters the outer barrel or cylinder above the lower valve, which constantly submerges the valves by the water standing on or over them, thus preventing their drying or becoming hard, and obviates the necessity of priming. We make the inner cylinder of either iron or brass, or of iron lined with copper or brass, as may be desired. The plunger is made of brass in all cases, unless otherwise ordered. The upper end of rod is made with stub end to weld to, or with socket and pin.

SIZES, CAPACITY AND PRICES OF FIG. 287.

No. 1, 3 inch cylinder, 0.10 gallon capacity per stroke, 7 inch stroke, 1½ inch pipe.....	$25 25
No. 2, 3½ inch cylinder, 0.16 gallon capacity per stroke, 7 inch stroke, 1½ inch pipe.....	27 25
No. 3, 4 inch cylinder, 0.20 gallon capacity per stroke, 7 inch stroke, 2 inch pipe.....	30 50
No. 4, 5 inch cylinder, 0.40 gallon capacity per stroke, 10 inch stroke, 2½ inch pipe.....	44 00
No. 5, 6 inch cylinder, 1.20 gallon capacity per stroke, 10 inch stroke, 3 inch pipe.....	50 00

The above sizes of pipes can be somewhat reduced without affecting the efficiency of the Pump. All parts of these Pumps are made with special tools, so that they will interchange.

Fig. 62 represents a Force Pump used very extensively all over the country in connection with wind mills at railroad stations, mills, factories, etc., or for any situation where a constant stream is to be elevated to any desired height. It will also be found very convenient and unsurpassed for filling tanks, supplying steam boilers, etc. The valve-seat, stuffing-gland and oil-reservoir are entirely of brass. It has wrought iron pitman straps to weld to, is firmly bolted to the finely ornamented plank and requires no skill to set up and run. We also construct these Pumps of brass, with metallic valves and piston for pumping hot or cold water, wines or acetous liquids, chemicals, etc., when so ordered.

SIZES, CAPACITY AND PRICES OF FIG. 62.

	Iron.	Brass.
No. 1, 2½ inch cylinder, 0.08 gallon capacity per stroke, 1¼ inch pipe.....	$ 9 50	$16 00
No. 2, 3 inch cylinder, 0.125 gallon capacity per stroke, 1¼ or 1½ inch pipe.....	10 00	17 00
Metallic Valves and Piston, extra.....	2 00	3 00

"EAGLE" WIND MILL FORCE PUMP, WITH COCK.

ON BASE OR BRACKETS, WITH REVOLVING BRAKE AND BRASS PISTON ROD.

Fig. 281.

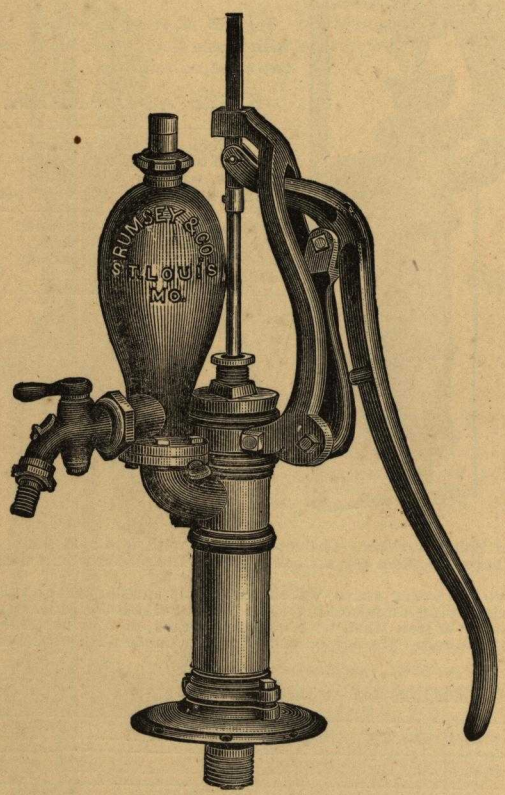


Fig. 281 represents our new Force Pump on Base, arranged for use with Wind Engines. It is especially designed for forcing water to elevated tanks, and is also so arranged that the water can be drawn from the tank, through the same pipe, and hose can be attached to the cock and conducted any distance, or in case of necessity it may be used as an efficient fire engine.

WITH REVOLVING BRAKE AND BRASS PISTON ROD.

Fig. 282.

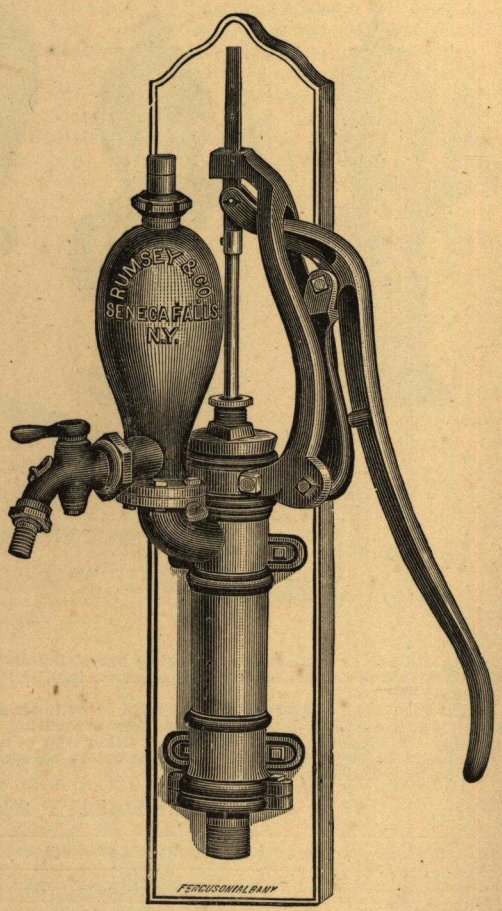


Fig. 282 is the same as Fig. 281, with all the good qualities of that Pump. It is arranged with Brackets, for convenience of bolting to a plank, wall or partition. They can be connected to Wind Mill, or operated by hand power, as occasion requires.

SIZES, CAPACITY AND PRICES. (Figs. 281 and 282.)

	Iron.	Brass.
No 1, 2½ inch Cylinder, capacity per stroke 0.06 gallon, size of pipe 1¼ inch.....	$13 50	$19 00
No. 2, 3 inch Cylinder, capacity per stroke 0.08 gallon, size of pipe 1¼ or 1½ inch.....	15 50	20 50
No. 3, 4 inch Cylinder, capacity per stroke 0.20 gallon, size of pipe 1½ or 2 inch.....	24 00	37 00

The 2½ and 3-inch Pumps work 6 inches stroke, and the 4-inch Pump 7½ inches stroke.

PACIFIC DOUBLE-ACTING FORCE PUMP.

FOR WIND MILLS, HOUSE USE, ETC.

Fig. 318.

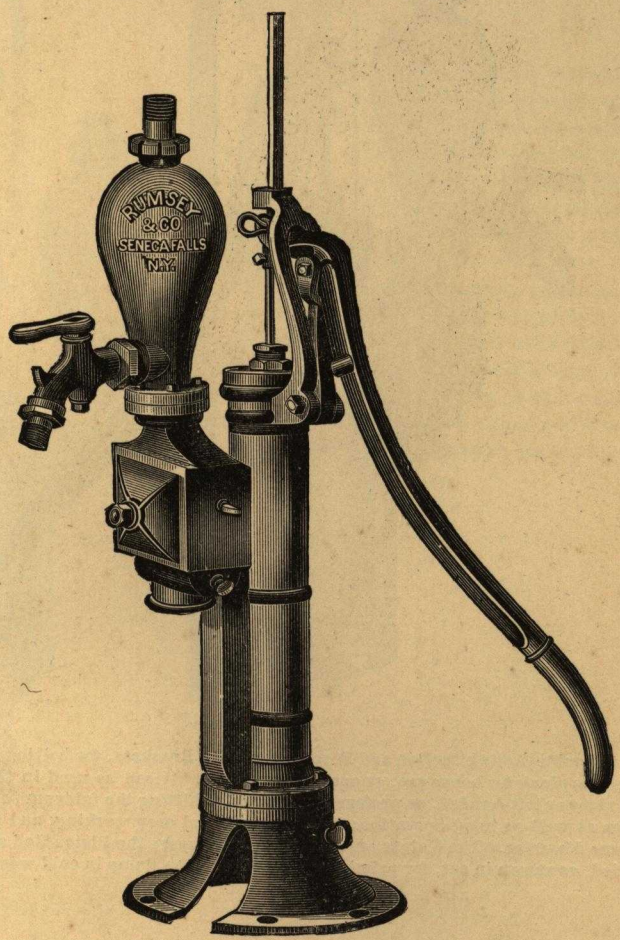


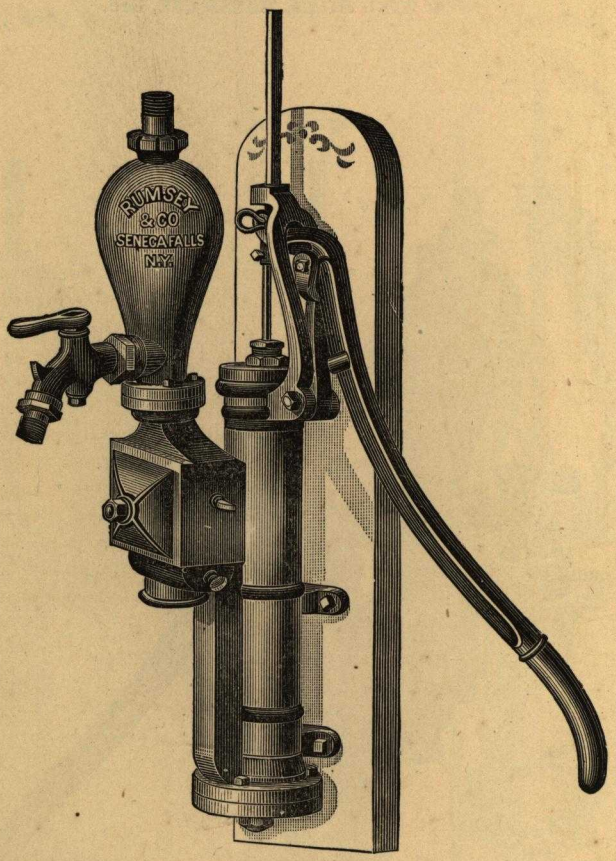
Fig. 318 is another design of our "Pacific Railroad Force Pumps," on Base. In other respects it is similar to Fig. 317, to which refer for further description. The valves are all contained in a valve box, shown on side of cut, and are easily accessible for examination or repairs by removing the one bolt in front without disturbing the pipes. The cap or head forms a reservoir for a mixture of oil and water, serving the double purpose of lubrication and preventing the access of air to the cylinder on the down stroke of the piston—an improvement ensuring perfect working, and peculiar to our pumps. We line the cylinder with copper or brass, as preferred by our customers. These Pumps are tasteful in design, and unsurpassed for durability. Each part is exactly duplicated in every Pump and interchangeable. The long lever has an extremely short fulcrum, making it work easily under severe service. These Pumps are extensively used in foreign countries, and compare favorably with our Engine Well Pumps, Figs. 115, 118, etc., especially in warm climates. The Cock is screwed for 1 inch hose coupling. We make two sizes, both of iron, and with copper or brass lined cylinder, as preferred. See pages 558 and 559 for Cylinders. Sizes, capacity, prices and deductions same as Fig. 317—see next page.

For prices of Foot Valves and Strainers, see page 557.

PACIFIC DOUBLE-ACTING FORCE PUMP,

ON BASE OR BRACKETS, FOR WIND-MILL ATTACHMENT,
HOUSE USE, ETC.

Fig. 317.



This cut shows our new Double-Acting Suction and Force Pump with Brackets, for bolting to the side of the tower for Wind Mill power, or on the plank for house use, as occasion requires. It can be used in the house like any Force Pump, and worked either right or left-handed, as preferred, by simply shifting the fulcrum to opposite side of plank. It is well adapted to power as well as hand operation; is very steady and easy working, and equal in capacity to two single-acting Pumps of same diameter. The Valves are convenient of access; the Piston Rod and Gland are of brass, and brass plugs are provided, as shown in cut, for priming and emptying the Pump in cold weather.

SIZES, CAPACITY AND PRICES.

No. 1, 2½ inch Cylinder, capacity per stroke 0.10 gallon, 1¼ inch pipe	$22 50	$27 50
No. 2, 3 inch Cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	25 00	31 00

DEDUCTIONS.—We deduct $1.50 from list when fitted for lead or iron pipe instead of Cock; $1.00 when fitted with spout instead of Cock; and $3.50 when furnished without both Cock and Air Chamber. Cock screwed for 1 inch hose coupling.

For price of Foot Valves and Strainers, see page 557.

DOUBLE-ACTING RAILROAD FORCE PUMP,

MOUNTED ON PLANK, FOR WIND MILL POWER.

Fig. 65.

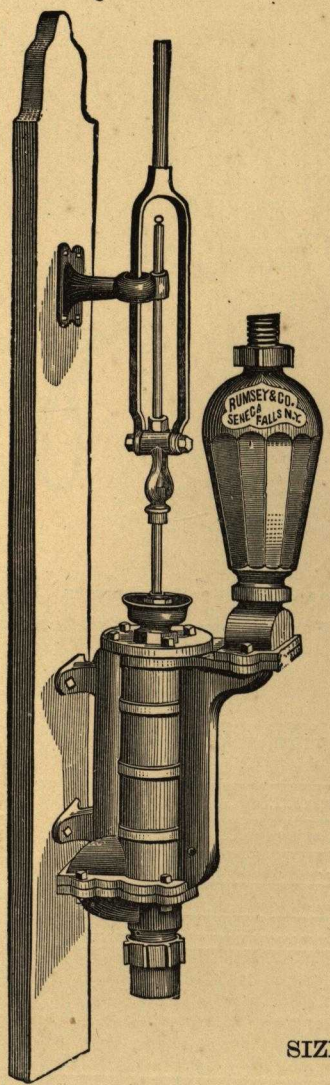


Fig. 65 represents a very efficient Double-Acting Force Pump, fitted for attaching to a crank driven by machine power. This Pump is made in the most thorough and workmanlike manner, both in principle and construction. It has an unusually large solid brass rod, with a heavily forged pitman attached, and all parts are firmly bolted through strong flanges, effectually preventing the possibility of leakage at any point. The Air Chamber can have one or two outlets, at the option of the purchaser. For all places where a constant and rapid supply of water is required, we can unhesitatingly recommend it as a first-class Pump in every respect, and for steady and uniform action while in operation, it is unexcelled. It is admirably calculated for being driven by power without the use of a balance wheel to regulate its motion. We furnish counter-shaft, crank, pulleys or gears, hangers, post boxes and pitman heads, for driving this Pump, at but a trifling advance on cost of labor and material. It is in extensive use in tanneries, factories, etc., and also for Wind Mill power.

SIZES, CAPACITY AND PRICES.

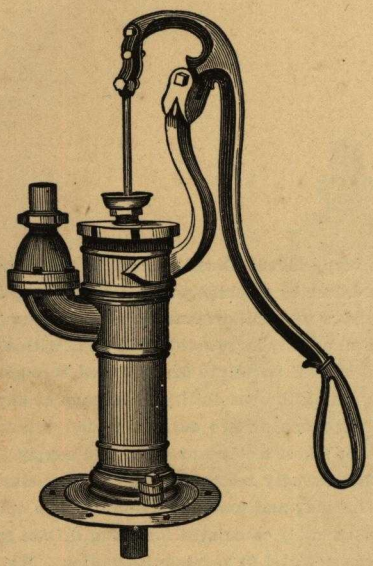
	Brass.	Iron.
No. 17, 2 in. Cyl., 8 in. stroke, capacity per stroke 0.10 gall., 80 strokes per min., 1 in. pipe.....	$17 50	$30 00
No. 17, 2½ in. Cyl., 8 in. stroke, capacity per stroke 0.16 gall., 75 strokes per min., 1¼ in. pipe.....	21 00	39 00
No. 17, 3 in. Cyl., 8 in. stroke, capacity per stroke 0.25 gall., 70 strokes per min., 1½ in. pipe.....	25 00	52 00
No. 17, 3½ in. Cyl., 8 in. stroke, capacity per stroke 0.42 gall., 60 strokes per min., 2 in. pipe.....	30 00	74 00
No. 17, 4 in. Cyl., 8 in. stroke, capacity per stroke 0.45 gall., 50 strokes per min., 2 in. pipe.....	44 00	99 00
No. 17, 4½ in. Cyl., 8 in. stroke, capacity per stroke 0.50 gall., 50 strokes per min., 2 in. pipe.....	58 00	142 00
No. 17, 5 in. Cyl., 8 in. stroke, capacity per stroke 0.67 gall., 40 strokes per min., 2½ in. pipe.....	80 00	170 00
No. 17, 6 in. Cyl., 8 in. stroke, capacity per stroke 1.00 gall., 40 strokes per min., 3 in. pipe.....	100 00	200 00

All sizes above 3 inch Cylinder are made with Gun Metal Valves for hot liquids, etc., when so ordered. For prices of Foot Valves and Strainers, see page 557.

IRON FORCE PUMPS

ON BASE.

Fig. 130.



ON BASE, WITH AIR CHAMBER.

Fig. 131.

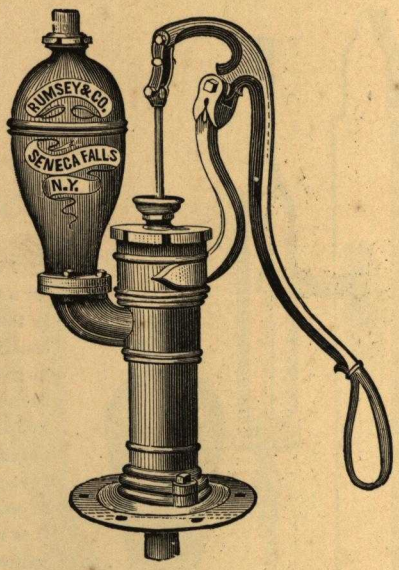


Fig. 131 represents the same Pump as that shown under Fig. 130, with the addition of an Air Chamber. It is used principally for supplying tanks in small houses for bathing purposes, etc. We make three sizes, fitted for attaching lead or iron pipe, as follows:

SIZES AND PRICES OF FIGS. 130 AND 131.

No. 1, Fig. 130, 2¼ inch caliber, without Air Chamber, suitable for 1¼ inch pipe	$ 9 50
No. 1, Fig. 130, 3 inch caliber, without Air Chamber, suitable for 1¼ or 1½ inch pipe	11 00
No. 2, Fig. 131, 2¼ inch caliber, suitable for pipe 1¼ inch caliber, each	10 00
No. 2, Fig. 131, 3 inch caliber, suitable for pipe 1¼ or 1½ inch caliber, each	12 00
No. 2, Fig. 131, 4 inch caliber, suitable for pipe 2 inch caliber, each	21 00

No. 1 BRASS CYLINDER PUMPS.

Ne. 1, Fig. 130, 2¼ inch caliber, without Air Chamber, suitable for 1¼ inch pipe	$14 00
No. 1, Fig. 130, 3 inch caliber, without Air Chamber, suitable for 1¼ or 1½ inch pipe	15 00

No. 2 BRASS CYLINDER PUMPS.

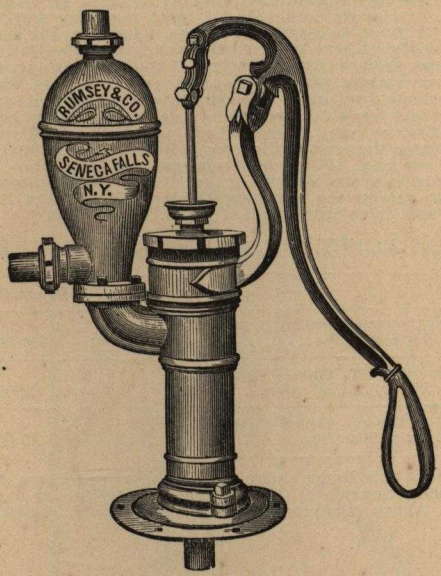
No. 2, Fig. 131, 2¼ inch Brass Cylinder	$15 00
No. 2, Fig. 131, 3 inch Brass Cylinder	16 00
No. 2, Fig. 131, 4 inch Brass Cylinder	30 00

Side Pumps on plank, same price.

FORCE PUMP,

ON BASE, WITH AIR CHAMBER, HAVING TWO OUTLETS.

Fig. 132.



IRON FORCE PUMP,

ON BASE, WITH AIR CHAMBER, HAVING TWO OUTLETS. COCK ON SIDE OUTLET.

Fig. 133.

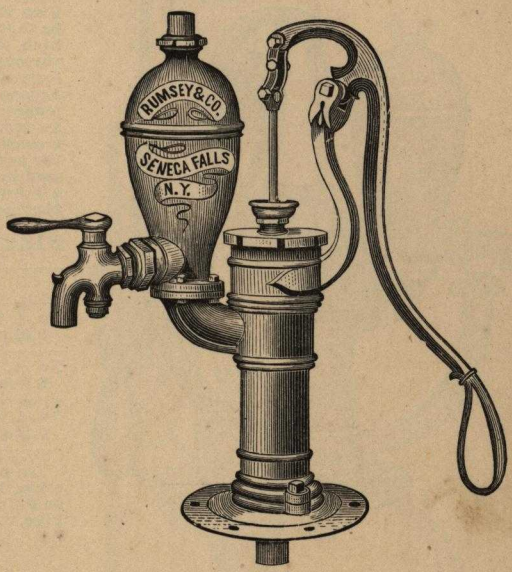


Fig. 132 shows the same Pump as Fig. 131, with an additional outlet to the air chamber. It will be seen that with this arrangement water can be forced in two, or either of two directions, and to any reasonable distance. By the addition of a cock attached to the horizontal discharge its usefulness can be greatly increased, as it can then be used as a Tank Pump, for filling bath tubs, wash basins, etc., in upper rooms, as well as for the ordinary Cistern Pump in the kitchen. The Pumps of this class are built in the most careful and substantial manner, and of the best materials. Our Pumps are also subjected to the most accurate tests before leaving the factory. These Pumps are easily adapted to any location. The lever can be revolved to any desired position and held firmly in place. It can also be left loose without danger of injury, and swung out of the way when not in use. We make this entire class of Pumps either of iron, or with Cylinder of Brass, or entirely of brass, except Lever, Fulcrum, Base and Air Chamber.

SIZES, CAPACITY AND PRICES OF FIG. 132.

	Iron.	Brass Cyl.
No. 3, 2⅛ inch cylinder, capacity per stroke 0.12 gallon, 1¼ inch pipe	$11 00	$16 00
No. 3, 3 inch cylinder, capacity per stroke 0.16 gallon, 1¼ or 1½ inch pipe	13 00	17 00
No. 3, 4 inch cylinder, capacity per stroke 0.40 gallon, 1½ or 2 inch pipe	22 00	32 00

The 4 inch Pump has a Rubber Buffer on Fulcrum. All our threads are cut to exact gauges, so that our repairs always fit. Side Pumps on plank, same price as above.

Fig. 133. This Pump is designed to be placed in a kitchen over the sink, where water may be drawn from the cock, or forced into a tank above for bathing purposes, by extending sufficient pipe from the upper outlet. We make three sizes, fitted for lead or iron, as follows:

SIZES AND PRICES OF FIG. 133.

Fig. 133, No. 3, 2⅛ inch caliber, suitable for pipe 1¼ inch	$12 00
Fig. 133, No. 3, 3 inch caliber, suitable for pipe 1¼ or 1½ inch	14 50
Fig. 133, No. 3, 4 inch caliber, suitable for pipe 1½ or 2 inch	23 50

No. 3 BRASS CYLINDER PUMP OF FIG. 133.

Fig 133, No. 3, 2¼ inch Brass Cylinder	$17 50
Fig. 133, No. 3, 3 inch Brass Cylinder	18 50
Fig. 133, No. 3, 4 inch Brass Cylinder	34 50
Extra for three feet of Hose and Discharge Pipe	3 00

Side Pumps on plank, same price.

FORCE PUMP ON BASE,

WITH FIRE ENGINE ATTACHMENTS.

Fig. 134.

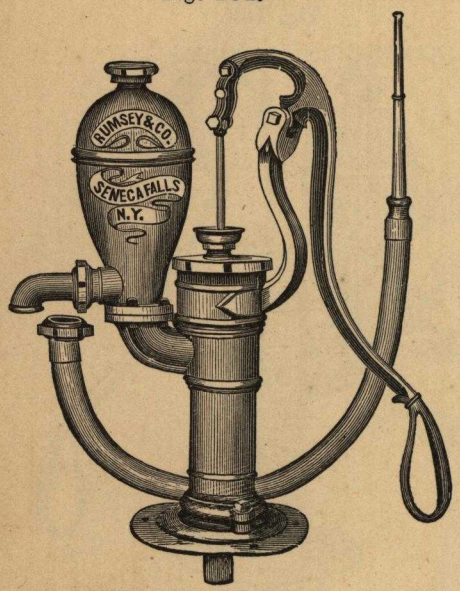


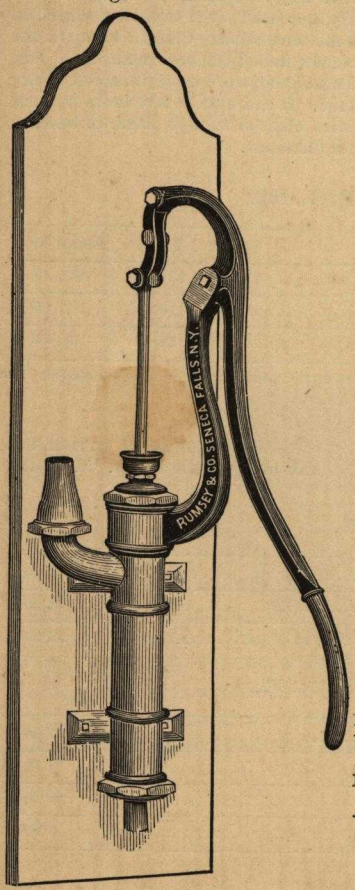
Fig. 134 represents substantially the same Pump as Fig. 133, with additions increasing its usefulness, making it at will an efficient Fire Engine, or very serviceable in all cases requiring water to be thrown with force to a greater or less distance. The many high testimonials we have received of its numerous merits from various sources, prompt us to recommend it among other purposes for use in livery stables, private barns and carriage houses, warehouses and private dwellings. We can recommend it for all such places in stronger terms than ever before, as, in addition to being an excellent Cistern Pump, hose can be attached very quickly and a constant stream thrown to a distance of 70 feet horizontally by the power of one man. When used as a common Lift Pump, the vent nut should be unscrewed two or three turns. If required as a Force Pump, screw the nut down tightly. The Piston Rod, Stuffing Box and Valve Seat are all of brass.

SIZES, CAPACITY AND PRICES OF FIG. 134.

	Iron.	Brass Cyl.
No. 4, 2¼ inch cylinder, capacity per stroke 0.05 gallon, 1¼ inch pipe	$15 00	$20 00
No. 4, 3 inch cylinder, capacity per stroke 0.08 gallon, 1¼ or 1½ inch pipe	16 00	22 00
No. 4, 4 inch cylinder, capacity per stroke 0.20 gallon, 1½ or 2 inch pipe	25 00	40 00

We also make this Pump entirely of brass, except lever, fulcrum, base and air chamber. The 4 inch Pump has Rubber Buffer on Fulcrum. Above prices include three feet Hose and Discharge Pipe.

Fig. 135.



FORCE PUMP ON PLANK,

WITH REVOLVING FULCRUM, BRASS PISTON ROD AND VALVE SEAT.

Fig. 135 represents our No. 0 Force Pump on plank. It is made with Brackets for bolting to plank, post, wall or any other suitable place. This Pump is extensively used as a Tank Pump, by being bolted to the boiler of portable engine; when ordering for such purpose we make the Pump with metallic piston and valves, and pack all joints with lead to prevent injury to these parts from the heat of the boiler. This Pump is made either right or left-handed, as ordered. It is constructed for service and durability, and is tastefully ornamented. The piston rod, stuffing box and valve seat are all of brass.

The Pipes and Valves of all our Force Pumps are of easy access, and can readily be examined, adjusted or repaired, without any disturbance to the Pump.

SIZES, CAPACITY AND PRICES OF FIG. 135.

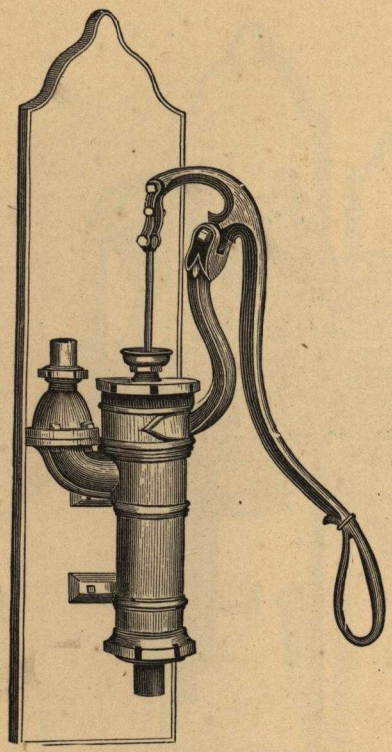
	Iron.	Brass Cyl.
No. 0, 2 inch cylinder, capacity per stroke 0.045 gallon, for 1 inch pipe	$8 00	$12 00
No. 0, 2¼ inch cylinder, capacity per stroke 0.06 gallon, for 1¼ inch pipe	9 50	14 00

We also make this Pump entirely of brass, except lever and fulcrum.

FORCE PUMPS ON PLANK,

WITH BRACKETS, PISTON ROD, REVOLVING BRAKE, ETC.

Fig. 136.



WITH AIR-CHAMBER.

Fig. 137.

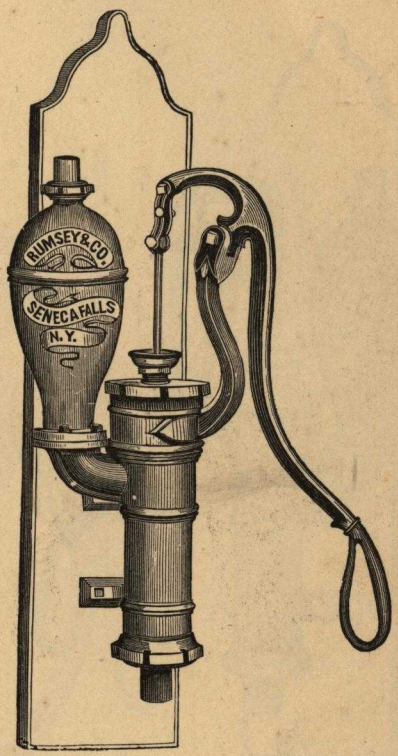


Fig. 136 is the same in construction as Fig. 130, except having brackets on the cylinder for bolting to wall, post or partition, instead of base. This feature allows the Pump to occupy the least possible space, and where room could not be spared for a Pump with base. They are made either right or left hand, suiting them for any position. Another convenience is that the fulcrum may be left loose, and the lever swung out of the way until wanted. We make them for pumping hot or cold water, wines, liquors, acids, etc. These Pumps cannot be excelled by any of their class for convenience, simplicity and durability.

SIZES, CAPACITY AND PRICES OF FIG. 136.

	Iron Cyl.	Brass Cyl.
No. 1, 2½ inch cylinder, capacity per stroke 0.06 gallon, for 1¼ inch pipe	$ 9 50	$14 00
No. 1, 3 inch cylinder, capacity per stroke 0.08 gallon, for 1¼ or 1½ inch pipe	11 00	15 00
No. 1, 4 inch cylinder, capacity per stroke 0.20 gallon, for 1½ or 2 inch pipe	18 00	30 00

Fig. 137 shows our No. 2 Side Force Pump, with brackets, and air chamber with one outlet. It is designed for the same uses as Fig. 131, in places where that could not be conveniently set up. It comprehends the leading features of all of this class, with valve-seat, piston-rod and stuffing-box made entirely of brass. The annexed prices are inclusive of the plank shown in cut. The 4 inch Pump has a rubber buffer on the Fulcrum to relieve the concussion at the end of the upward stroke of the plunger.

These Pumps are all made right or left hand as ordered, and the valves are tripped to avoid freezing, in the usual way—raising the lever to its full height and holding it in that position, when the water will immediately run back. To draw the water from the air-chamber, unscrew the plug from the flange of the discharge, on which the air-chamber rests. These Pumps, with all our other Force Pumps, possess many other useful and convenient features, giving them every element of a successful hydraulic machine in their entire composition. For many years they have been an acknowledged standard for quality and finish. Every part is made to test, and interchangeable, a feature of incalculable importance to the export trade.

SIZES, CAPACITY AND PRICES OF FIG. 137.

	Iron Cyl.	Brass Cyl.
No. 2, 2½ inch cylinder, capacity per stroke 0.06 gallon, for 1¼ inch pipe	$10 00	$15 00
No. 2, 3 inch cylinder, capacity per stroke 0.08 gallon, for 1¼ or 1½ inch pipe	12 00	16 00
No. 2, 4 inch cylinder, capacity per stroke 0.20 gallon, for 1½ or 2 inch pipe	21 00	31 00

FORCE PUMPS ON PLANK,

WITH AIR CHAMBERS, HAVING TWO OUTLETS.

Fig. 138.

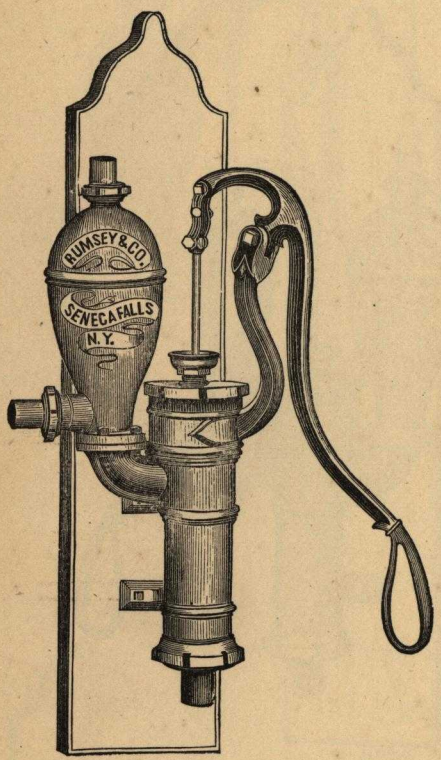
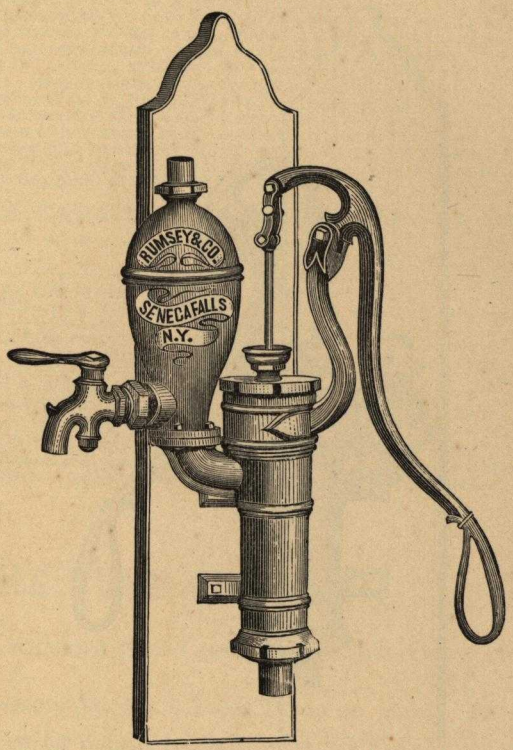


Fig. 139.



(Cock on side Outlet.)

Fig. 138 represents our No. 3 Side Force Pump on Plank. It resembles Fig. 132, and its particular purposes and functions are fully described under that Figure. It is, however, adapted for use in other places where a Base Pump is not convenient. It requires no platform, but can be fastened to the wall or any vertical partition, near the cistern or reservoir, thus utilizing space and convenience. These Pumps can be placed inside the house, when the cistern is out of doors (having all anti-freezing appliances), a feature very frequently desirable. Having the rod and stuffing-box of brass, they will not corrode and destroy the packing, thus avoiding the leakage and repairs at that point, so common in Pumps of other makers.

SIZES, CAPACITY AND PRICES OF FIG. 138.

	Iron Cyl.	Brass Cyl.
No. 3, 2¼ inch cylinder, capacity per stroke 0.06 gallon, for 1¼ inch pipe	$11 00	$16 00
No. 3, 3 inch cylinder, capacity per stroke 0.08 gallon, for 1¼ or 1½ inch pipe	13 00	17 00
No. 3, 4 inch cylinder, capacity per stroke 0.20 gallon, for 1½ or 2 inch pipe	22 00	32 00

Fig. 139 shows our No. 3 Side Force Pump on Plank, having a Cock on side outlet. The functions of this Pump are fully detailed under Fig. 133. It is built in the same substantial manner that we construct all our Force Pumps, and is well secured to a handsome plank ready for shipment. The cock is connected to the air-chamber by an attachment having a right and left-hand screw, holding it securely and tightly. The cock has also a screw and "union" on the discharge end to attach hose, if so desired. All parts of our Force Pumps are made from iron patterns of marvelous accuracy, and the screws cut to steel gauges, and we can therefore guarantee that all corresponding parts are exactly identical in every Pump of our manufacture. No possible test is wanting to give them the greatest attainable perfection in their entire construction.

SIZES, CAPACITY AND PRICES OF FIG. 139.

	Iron Cyl.	Brass Cyl.
No. 3, 2¼ inch cylinder, capacity per stroke 0.06 gallon, for 1¼ inch pipe	$12 50	$17 00
No. 3, 3 inch cylinder, capacity per stroke 0.08 gallon, for 1¼ or 1½ inch pipe	14 50	18 50
No. 3, 4 inch cylinder, capacity per stroke 0.20 gallon, for 1½ or 2 inch pipe	23 50	34 50

Above prices include plank. All our Hand Force Pumps have brass piston-rod and stuffing-box.

FORCE PUMP ON PLANK,

WITH FIRE ENGINE APPLIANCES.

Fig. 140.

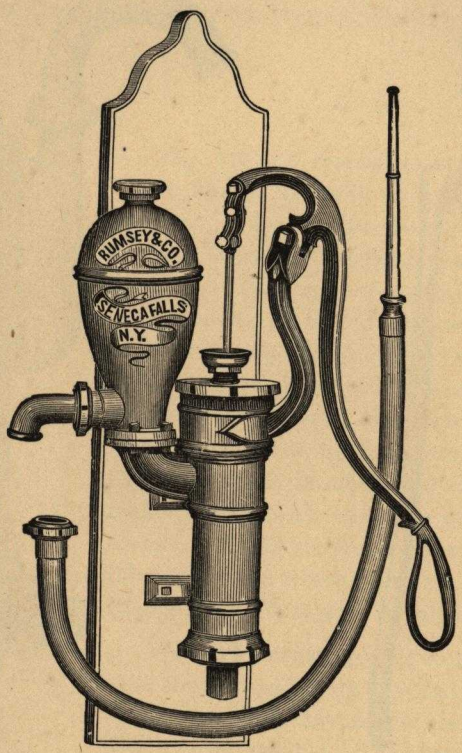


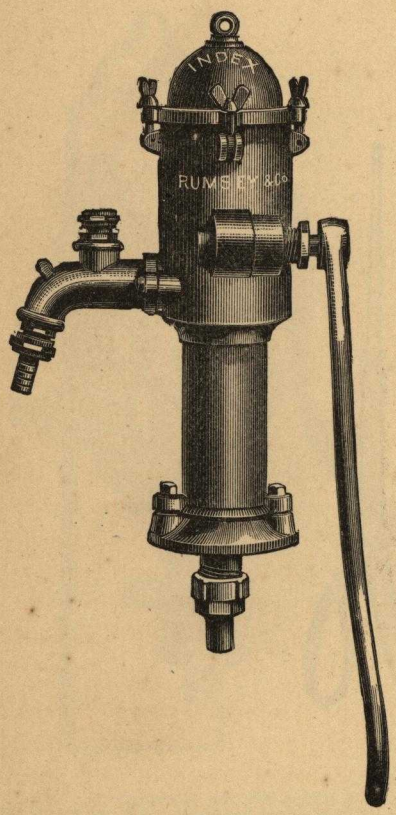
Fig. 140 shows our No. 4 Side Force Pump on Plank, with appliances converting it quickly and easily into a powerful and simple working Fire Engine. When used for this purpose the hose is attached to the end of the spout by a screw (not shown), and the nut situated on top of Air Chamber is screwed home tightly. For service as a Lift Pump, remove hose, and unscrew the vent nut two or three turns, relieving pressure in Air Chamber by letting air escape. All our Force Pumps have Brass Rods, Valve Seats and Stuffing Boxes. The Cylinders are bored perfectly straight the entire length, and afterwards polished as finely as gun barrels. All threads are cut to exact gauges, so that repairs and duplicates fit exactly without change or delay. The same care is exercised in every branch of their production as in much more expensive goods, and as Pumps in the abstract, one class is comparatively as efficient as the other.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 4, 2¼ inch cylinder, capacity per stroke 0.06 gallon, 1¼ inch pipe	$15 00	$20 00
No. 4, 3 inch cylinder, capacity per stroke 0.08 gallon, 1¼ or 1½ inch pipe	16 00	22 00
No. 4, 4 inch cylinder, capacity per stroke 0.20 gallon, 1½ or 2 inch pipe	25 00	40 00

NEW STYLE LIFT AND FORCE PUMP, "THE INDEX."

Fig. 292.



The accompanying cut (Fig. 292) represents our new Force Pump, "The Index," combining all the perfections of the Pitcher Spout Cistern Pump, with the same ease of access to the working parts, and also containing the valuable qualities of a Force Pump, in any case where it is practicable to use one of that class and style.

It is more compact and of greater capacity of cylinder than is usual in other Force Pumps of equal price. The ease and simplicity with which it is worked, in consequence of the new arrangement of the lever, has won for it a high degree of favor wherever used.

This Pump is provided with a "Union Coupling," on the base, and is fitted for lead or iron pipe. The valve-seat and stuffing-gland are of brass.

DIRECTIONS FOR USE.

By unscrewing the brass plug, situated at the top of the air-chamber, it is changed into an ordinary "Lift" Pump; the reverse action again changes it back to a powerful "Force" Pump. To gain access to the interior, remove the top of the air chamber by unscrewing the thumb-nuts which hold it in place.

SIZES, CAPACITY AND PRICES OF FIG. 292.

No. 0, 2½ inch bore, capacity per stroke 0.06 gallon, for 1¼ inch pipe	$10 00
No. 1, 3¼ inch bore, capacity per stroke 0.125 gallon, for 1¼ inch pipe	12 00
No. 2, 4 inch bore, capacity per stroke 0.165 gallon, for 1¼ or 2 inch pipe	20 00
No. 0, 2½ inch bore, with gas set length	15 00
No. 1, 3¼ inch bore, with gas set length	17 00
No. 2, 4 inch bore, with gas set length	25 00

When arranged with cock in spout, add $2 50 to list on above prices.

NEW STYLE FORCE PUMP.

Fig. 129.

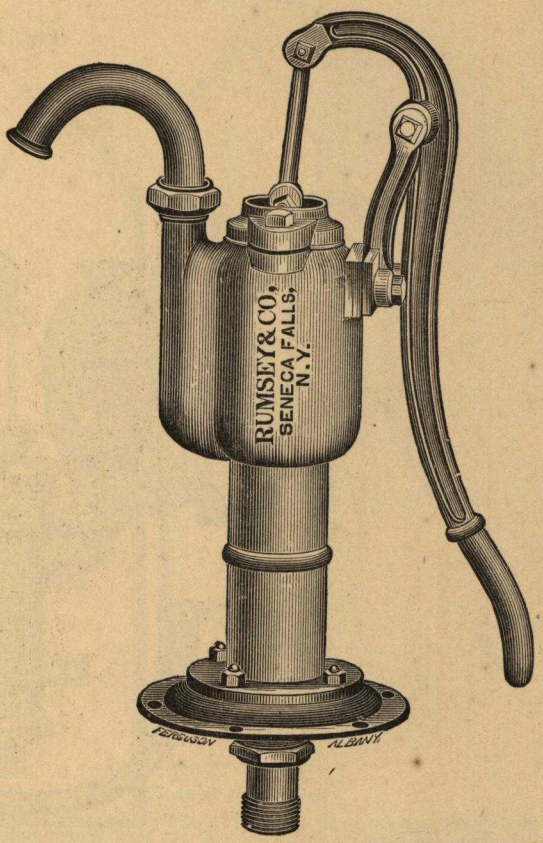


Fig. 129 is a representation of our New Style Force Pump, one of the best and cheapest of the kind in the market. It is a single acting Pump, having two cylinders and plungers. The upper cylinder being but half the size of the lower one, receives a portion of the water raised by the larger plunger on its up stroke, which is discharged from the spout or hose at the downward stroke of its piston, while the upper part of the Pump is converted into an air-chamber by the small cylinder and its tightly fitting piston—all tending to produce the effect of a double acting Pump.

We send goose-neck spout and brass tube with each size of Pump; also hose and discharge pipe for use with them, when ordered.

SIZES, CAPACITY AND PRICES OF FIG. 129.

No. 23, 2½ inch cylinder, capacity per stroke 0.10 gallon, for 1¼ inch pipe	$12 00
No. 23, 3 inch cylinder, capacity per stroke 0.125 gallon, for 1½ inch pipe	15 00

For 3 feet of Hose and Discharge Pipe, extra list price, $3 00.

HOUSE FORCE PUMP,

MOUNTED ON PLANK, WITH PITMAN AND GUIDE.

Fig. 141.

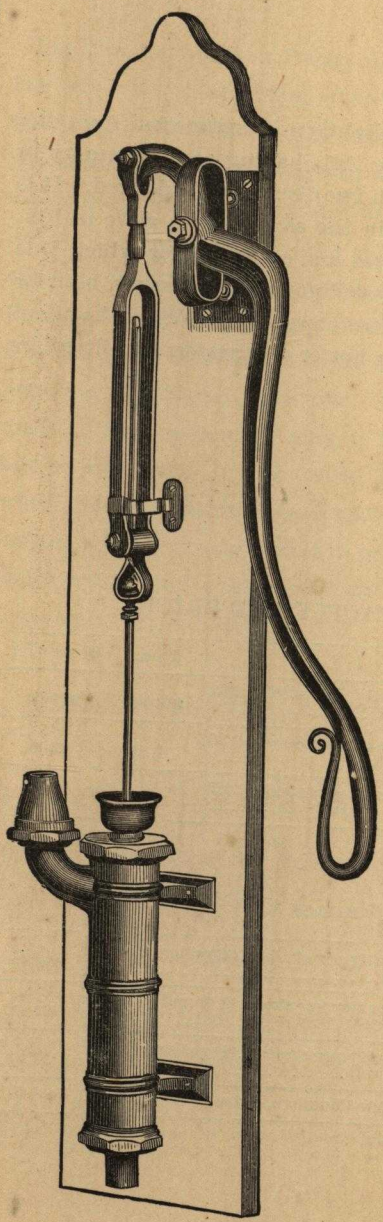


Fig. 141 is a representation of our unequaled House Force Pump, mounted on a plank of perfectly seasoned lumber. It is made in the most thorough and substantial manner, is beautiful in design, tastefully painted and simple in action. It altogether combines symmetry, strength and utility in the highest degree, and no well-appointed house can afford to be without it. This Pump is especially designed to draw water from the cistern and force it to supply elevated points, such as bathing rooms, reservoirs in the upper part of the building, etc. It is built without Air-Chamber to suit plumbers and other customers preferring to make their own Air-Chamber of Copper or other expensive metals. The Lever is made very long, with corresponding fulcrum bolt on which it works. The Rod, Stuffing-Box, Rising Main, Nuts, etc., are all Brass.

We have recently greatly improved this class of Pumps, until they are as nearly as possible perfect in every respect. For in-door use they cannot be surpassed by any other Pump in the market. They are fitted for lead or iron pipe and made right or left-handed, as ordered.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 1, cylinder 2 inch, capacity per stroke 0.055 gallon, size of pipe 1 inch	$14 00	$18 00
No. 2, cylinder 2½ inch, capacity per stroke 0.08 gallon, size of pipe 1¼ inch	15 00	20 00
No. 3, cylinder 3 inch, capacity per stroke 0.125 gallon, size of pipe 1¼ or 1½	16 50	22 00

BRASS.

No. 1, cylinder 2 inch, capacity per stroke 0.055 gallon, size of pipe 1 inch	$26 00
No. 1, cylinder 2½ inch, capacity per stroke 0.08 gallon, size of pipe 1¼ inch	30 00
No. 3, cylinder 3 inch, capacity per stroke 0.125 gallon, size of pipe 1¼ or 1½ inch	35 00

HOUSE FORCE PUMP,

MOUNTED ON PLANK, WITH PITMAN GUIDE AND AIR CHAMBER.

Fig. 142.

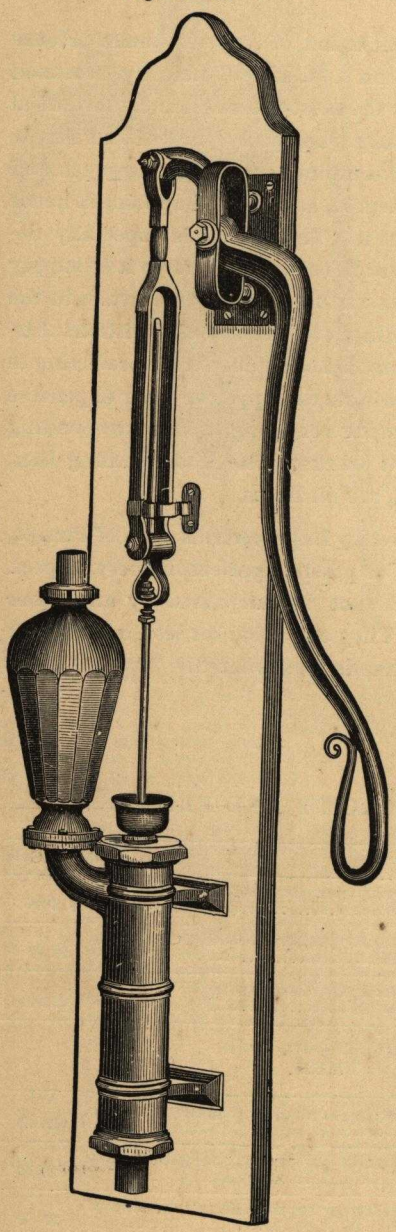


Fig. 142 differs but slightly in construction from the Pump described with Fig. 141, having an air chamber in addition as shown, or with two discharges, if desired. It is mounted and decorated in the same superb style as Fig. 141, and in all the purposes and capacities for which it is intended, is simply the best Pump in the market, both for variety of uses and perfect operation. We make them right or left handed, for hot or cold water, and fitted for lead or iron pipe.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 1, cylinder 2 inch, capacity per stroke 0.05 gallon, size of pipe 1 inch	$16 00	$21 00
No. 2, cylinder 2½ inch, capacity per stroke 0.16 gallon, size of pipe 1¼ inch	17 00	23 00
No. 3, cylinder 3 inch, capacity per stroke 0.125 gallon, size of pipe 1¼ or 1½ inch	18 50	25 00

BRASS.

No. 1, cylinder 2 inch, capacity per stroke 0.055 gallon, size of pipe 1 inch	$28 00
No. 2, cylinder 2½ inch, capacity per stroke 0.08 gallon, size of pipe 1¼ inch	32 00
No. 3, cylinder 3 inch, capacity per stroke 0.125 gallon, size of pipe 1¼ or 1½ inch	37 00
With Brass Cock on side of Air Chamber, extra price list	5 00

HOUSE FORCE PUMP, ON PLANK,

WITH AIR CHAMBER, HAVING TWO DISCHARGES AND COCK.

Fig. 290.

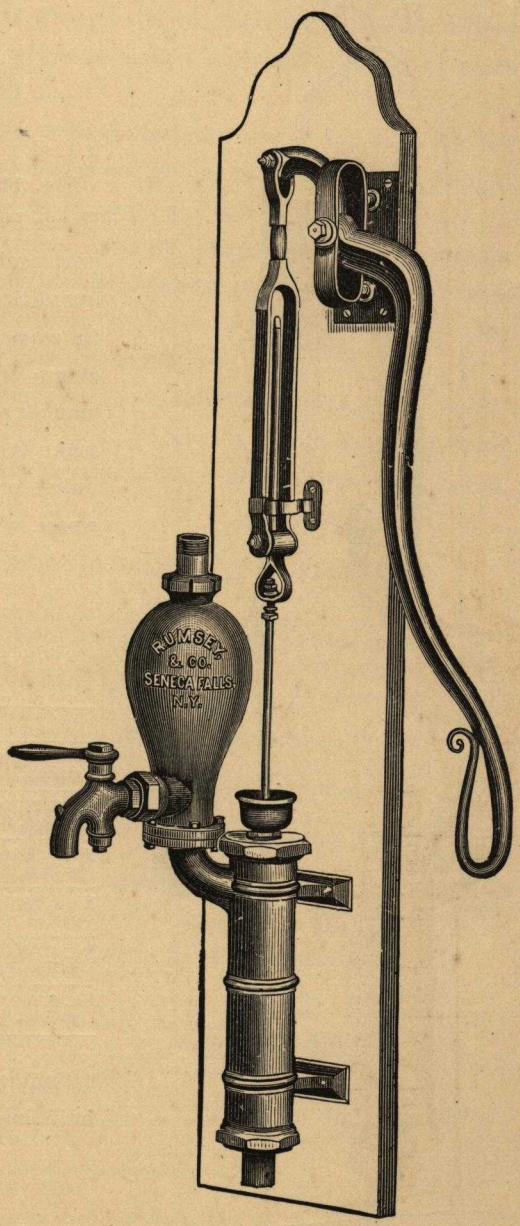


Fig. 290 represents a Pump similar to Fig. 142, but with the addition of an air-chamber, having two discharges and a cock on side outlet, these improvements greatly enlarging its usefulness. The faucet is threaded on the spout end for attaching hose, which convenience, in case of fire, will prove invaluable. These Pumps, like all of their class, are made right or left hand, as ordered, and can be made for pumping hot water, acids, etc. The cock is made of iron, with brass plug, if intended for hot or cold water, but if desired for pumping wines, liquors or acids, it is all made of the best bronze. This Pump is perfect in principles and construction, and unsurpassed for house purposes by any in the market.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 1, 2 inch cylinder, capacity per stroke 0.055 gallon, for 1 inch pipe....	$18 50	$23 50
No. 2, 2¼ inch cylinder, capacity per stroke 0.08 gallon, for 1¼ inch pipe..	19 50	25 50
No. 3, 3 inch cylinder, capacity per stroke, 0.125 gal., for 1¼ or 1½ in. pipe	21 00	27 50

BRASS.

No. 1, 2 inch cylinder, with brass cock, capacity per stroke 0.055 gallon, for 1 inch pipe.....	$32 00
No. 2, 2¼ inch cylinder, with brass cock, capacity per stroke 0.08 gallon, for 1¼ inch pipe.....	36 00
No. 3, 3 inch cylinder, with brass cock, capacity per stroke 0.125 gallon, for 1¼ or 1½ inch pipe....	41 00

DOUBLE-ACTING HOUSE FORCE PUMP,

MOUNTED ON PLANK, WITH PITMAN AND GUIDE. RIGHT OR LEFT HAND.

Fig. 144.

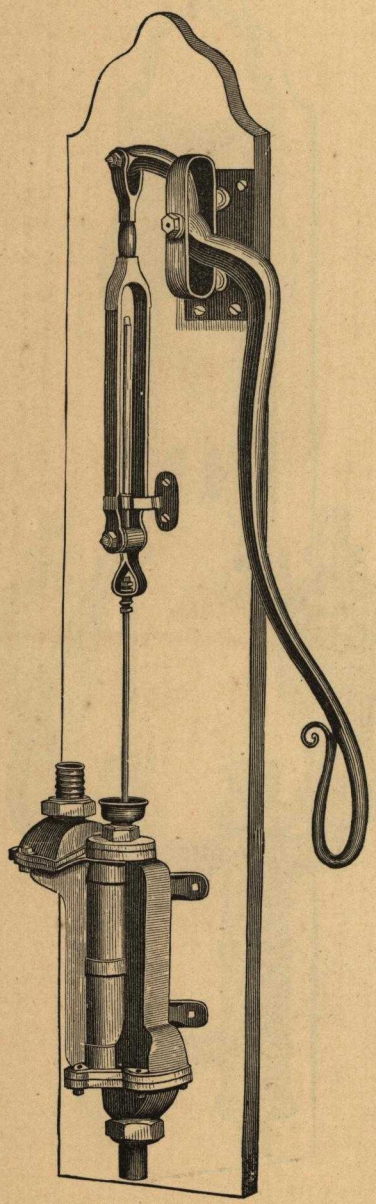


Fig. 144, in general outlines, shows our Double-Acting House Force Pump. This is a very useful, convenient and ornamental Pump for house purposes, or for elevating large quantities of water or other liquids in shops and factories, its capacity being almost double that of a single-acting Pump of equal diameter. It is mounted in the same manner as the preceding Figs. of House Force Pumps. We make them either right or left hand, with leather valves, unless ordered otherwise. We also make them for hot water, wines or acids, and likewise entirely of brass.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass.
No. 1, 2 inch cylinder, capacity per stroke 0.10 gallon, for 1 inch pipe	$13 50	$26 00
No. 2, 2½ inch cylinder, capacity per stroke 0.17 gallon, for 1¼ inch pipe	17 00	38 00
No. 3, 3 inch cylinder, capacity per stroke 0.25 gallon, for 1½ inch pipe	21 00	52 00
No. 4, 3½ inch cylinder, capacity per stroke 0.42 gallon, for 2 inch pipe	25 00	69 50
No. 5, 4 inch cylinder, capacity per stroke 0.45 gallon, for 2 inch pipe	37 00	94 00
No. 6, 4½ inch cylinder, capacity per stroke 0.50 gallon, for 2 inch pipe	50 00	136 00

Caliber of induction and discharge pipes should be one-half the size of cylinder.

DOUBLE-ACTING HOUSE FORCE PUMP,

MOUNTED ON PLANK, WITH PITMAN AND GUIDE, AIR CHAMBER, ETC.

Fig. 145.

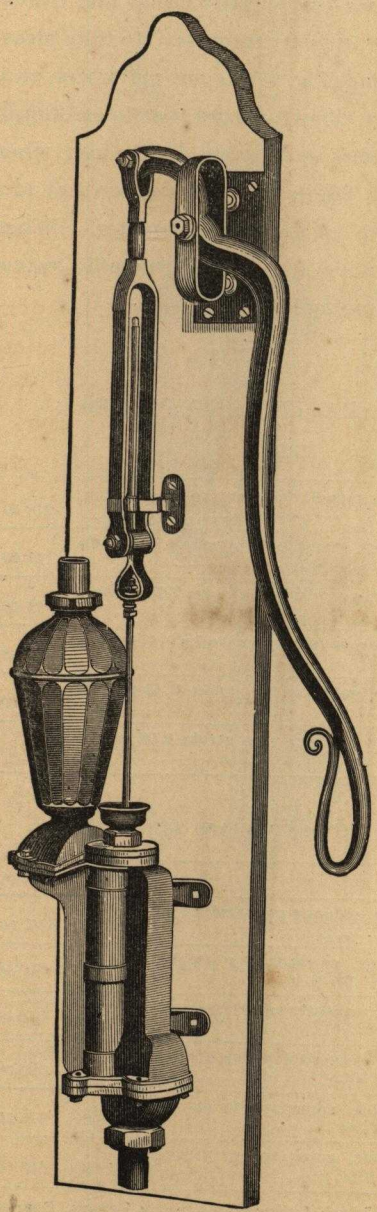


Fig. 145, excepting the addition of an Air Chamber, is like Fig. 144. It is made as shown in cut, but if so desired, we make the Air Chamber with two outlets at the same price. These Pumps are double-acting and raise double the volume of water that a single-acting Pump of same diameter will do.

The water courses are large and direct, reducing the friction to its minimum, giving these Pumps the highest possible economy of power and efficiency in operation.

The reversible Fulcrum affords every convenience for working, while their principles of construction and thorough and substantial finish make them unexcelled by any other Pump of the class in the market.

The mountings are the same as Figs. 141 and 142, and for all sizes above 3 inch Cylinder, the Lever, Fulcrum, Guide and Pitman are correspondingly enlarged and strengthened.

SIZES, CAPACITY AND PRICES.

IRON.

No. 1, 2 inch cylinder, capacity per stroke 0.10 gallon, 1 inch pipe	$15 50
No. 2, 2½ inch cylinder, capacity per stroke 0.17 gallon, 1¼ inch pipe	19 00
No. 3, 3 inch cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	23 00
No. 4, 3½ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	28 50
No 5, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	42 00
No. 6, 4½ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	55 00

BRASS—WITH IRON AND BRASS AIR CHAMBER.

	Iron.	Brass.
No. 1, 2 inch cylinder, capacity per stroke 0.10 gallon, 1 inch pipe	$28 00	$ 38 00
No. 2, 2½ inch cylinder, capacity per stroke 0.17 gallon, 1¼ inch pipe	40 00	50 00
No. 3, 3 inch cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	54 00	64 00
No. 4, 3½ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	73 00	93 00
No. 5, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	98 00	118 00
No. 6, 4½ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	141 00	161 00

DOUBLE-ACTING HOUSE FORCE PUMP,

MOUNTED ON PLANK, AIR CHAMBER WITH COCK, IN IRON OR BRASS, AS ORDERED.

Fig. 291.

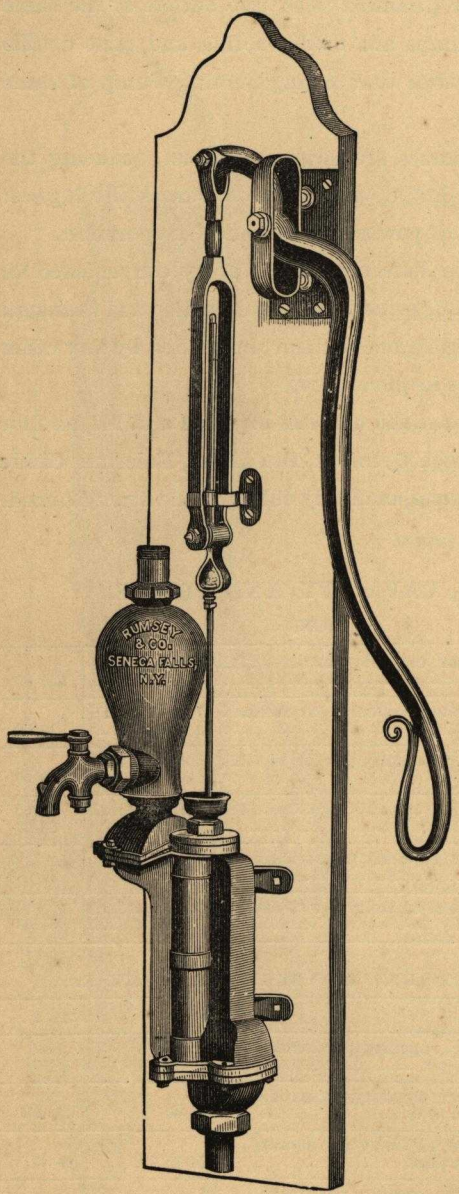


Fig. 291 shows our Double-Acting House Force Pump, described under Fig. 145, with the addition of a side outlet and cock—a decidedly useful and convenient improvement in many respects. We take pleasure in recommending Fig. 291 to our customers, and, well knowing its excellent qualities as a House Pump, we guarantee perfect satisfaction in its use, when properly set up. The capacity is double that of a single-acting Pump of the same diameter. When so ordered, we fit these Pumps with metallic valves and piston for pumping hot water, etc.

SIZES, CAPACITY AND PRICES.

IRON.

No. 1, 2 inch cylinder, capacity per stroke 0.10 gallon, 1 inch pipe	$18 00
No. 2, 2⅛ inch cylinder, capacity per stroke 0.17 gallon, 1¼ inch pipe	21 50
No. 3, 3 inch cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	25 50
No. 4, 3¼ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	31 00
No. 5, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	45 00
No. 6, 4¼ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	58 00

BRASS—WITH IRON AND BRASS AIR CHAMBER.

	Iron.	Brass.
No. 1, 2 inch cylinder, capacity per stroke 0.10 gallon, 1 inch pipe	$ 30 50	$ 41 00
No. 2, 2⅛ inch cylinder, capacity per stroke 0.17 gallon, 1¼ inch pipe	42 50	51 00
No. 3, 3 inch cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	56 50	61 00
No. 4, 3¼ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	75 50	86 00
No. 5, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	101 00	116 00
No. 6, 4½ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	145 00	163 00

All sizes larger than 3 inch Cylinders have the Levers, Bearers, Guides and Plank considerably enlarged.

HOUSE FORCE PUMP WITH FLY-WHEEL,

MOUNTED ON PLANK, WITH PITMAN, GUIDE, CRANK SHAFT AND HANDLES.

Fig. 276.

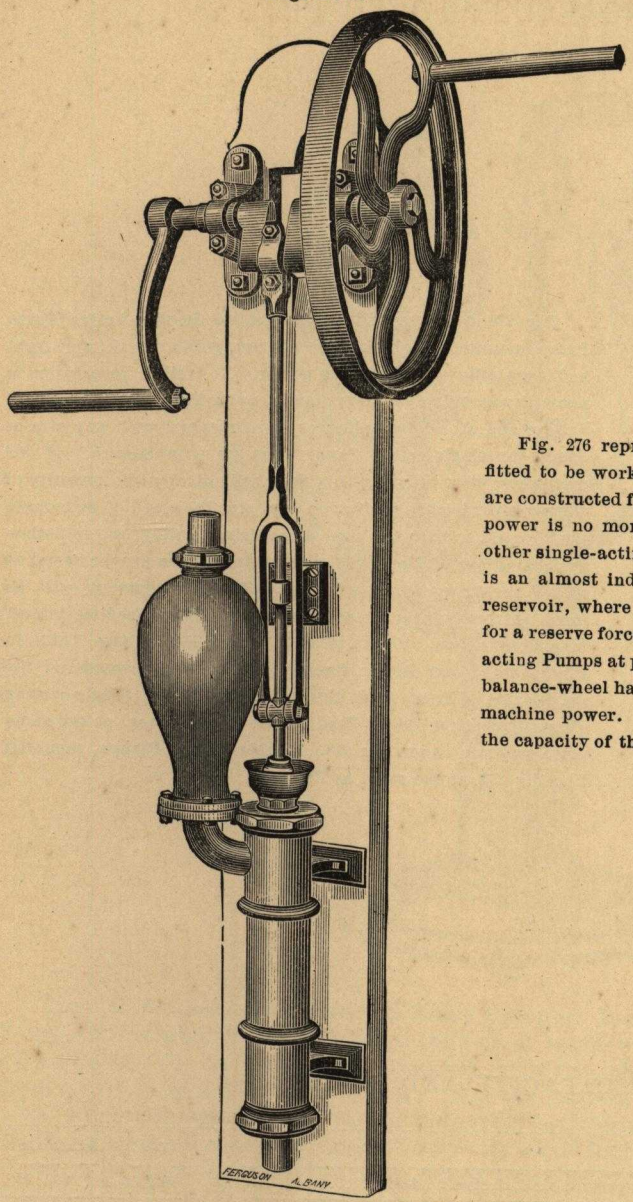


Fig. 276 represents our Single-Acting House Force Pump, fitted to be worked by crank with winch handles. The handles are constructed for the use of two or four men, although so much power is no more necessary to do the same work than on any other single-acting Pump rigged differently. The balance-wheel is an almost indispensable adjunct in this connection, being a reservoir, where power is stored at certain points of the stroke, for a reserve force. We mount any sizes of our single or double-acting Pumps at prices corresponding to those given below. The balance-wheel has a 2-inch face, on which a belt can be used for machine power. The wheel is varied in diameter, according to the capacity of the Pump.

SIZES, CAPACITY AND PRICES.

SINGLE-ACTING.

	Iron.	Brass Cylinder
No. 1, 2 inch Cylinder, capacity per stroke 0.055 gallon, size of pipe 1 inch	$36 00	$45 00
No. 2, 2½ inch Cylinder, capacity per stroke 0.08 gallon, size of pipe 1¼ inch	38 00	48 00
No. 3, 3 inch Cylinder, capacity per stroke 0.125 gallon, size of pipe 1¼ or 1½ inch	40 00	54 00

DOUBLE-ACTING.

	Iron.	Brass Cylinder.
No. 1, 2 inch Cylinder, capacity per stroke 0.11 gallon, size of pipe 1 inch	$39 00	$51 00
No. 2, 2½ inch Cylinder, capacity per stroke 0.16 gallon, size of pipe 1¼ inch	41 00	56 00
No. 3, 3 inch Cylinder, capacity per stroke 0.25 gallon, size of pipe 1½ inch	45 00	62 00

For Iron Cock, Brass Plug, add $2.50 to list. For all Brass Cocks, add $5.00 to list.

DOUBLE-ACTING FORCE PUMP,

WITH TIGHT AND LOOSE PULLEYS, MOUNTED ON PLANK, FOR POWER.

Fig. 278.

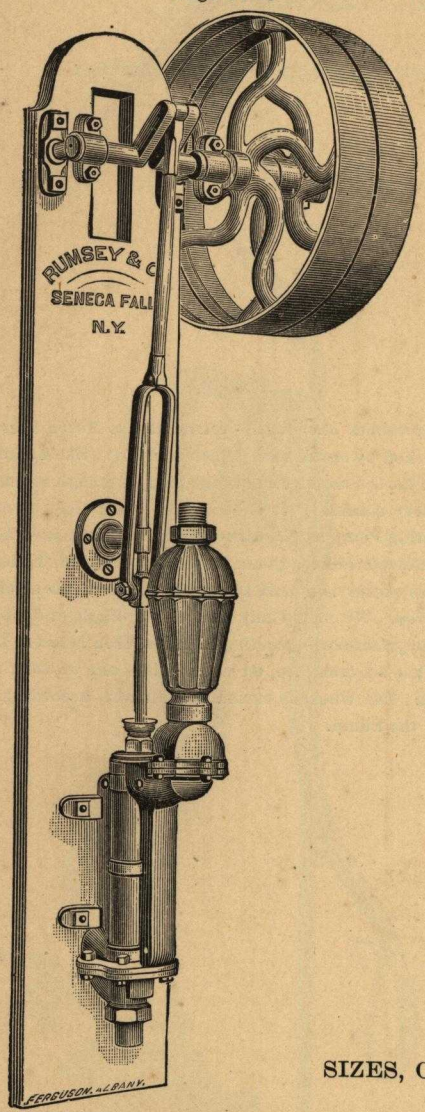


Fig. 278 is a correct illustration of our Double-Acting Force Pump, mounted on plank, with pitman, guide, crank, and tight and loose pulleys, for machine power. No further description is necessary for this well-known and popular Pump. We make the Pulleys and all other appliances to correspond with any size of double or single-acting Pumps that we manufacture. If our customers, when ordering this Fig., will specify the quantity of work required to be performed, and give the speed of their main shaft, together with the size of the driver pulley, we will then put on pulleys of the right size to insure the proper speed at which the Pump should be run. This arrangement will be found extremely convenient for running Boiler-Feeding Pumps in engine rooms. Please give H. P. of Boiler (see Table in Preface to Steam Boiler Pumps), and we will recommend the proper size of Pump to do the work. We mount Single-Acting Pump (except for Boiler Feeding) in this manner, at the same price as given under Fig. 276. Double-Acting Pumps, mounted like Fig. 276, at the same as Fig. 278.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 1, 2 inch Cylinder, capacity per stroke 0.11 gallon, size of pipe 1 inch	$39 00	$51 00
No 2, 2½ inch Cylinder, capacity per stroke 0.16 gallon, size of pipe 1¼ inch	41 00	56 00
No. 3, 3 inch Cylinder, capacity per stroke 0.25 gallon, size of pipe 1½ inch	45 00	62 00
No. 4, 3½ inch Cylinder, capacity per stroke 0.42 gallon, size of pipe 2 inch	51 00	81 00
No. 5, 4 inch Cylinder, capacity per stroke 0.45 gallon, size of pipe 2 inch	63 00	114 00
No. 6, 4½ inch Cylinder, capacity per stroke 1.50 gallon, size of pipe 2 inch	80 00	155 00

WITH GUN-METAL VALVES.

	Iron.	Brass Cyl.
No. 4, 3½ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	$61 00	$90 00
No. 5, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	73 00	124 00
No. 6, 4½ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	90 00	165 00

For Iron Cock with Brass Plug, add $2.50 to list. For all Brass Cock, add $5.00 to list.

RAILROAD FORCE PUMP,

AIR CHAMBER, WITH TWO DISCHARGES. ON BASE.

Fig. 150.

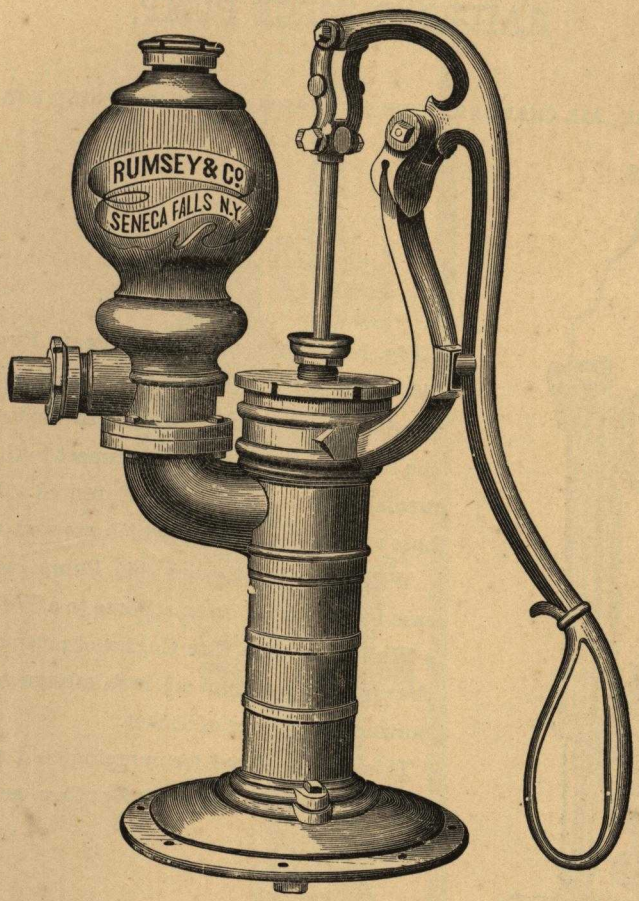


Fig. 150 represents our Railroad Force Pump on Base. This is a very strong and durable Pump and capable of doing a large amount of work with easy action, being built with that purpose especially in view. It is intended for use in places where a large amount of water is required to be raised by hand power. All the modern improvements of Force Pumps are contained in its construction. It has the revolving fulcrum with rubber bumper, and the rod, stuffing-gland, valve-seat and poppet valve are all of Brass. Having two openings for discharge pipes, it is suited for applying hose, which immediately converts it into a very efficient Fire Engine. We make it with Brackets also, like Fig. 149, making it a very convenient Pump for securing to the side of a building or partition. In all respects it cannot be commended too highly for any of its various purposes.

SIZES, CAPACITY AND PRICE.

	Iron.	Brass Cyl.
No. 1, 4 in. cylinder, capacity per stroke 0.20 gallon, for 2 inch pipe	$21 00	$32 00
For three feet hose and discharge pipe, add to list price		5 00
Adapted for hot water or liquors at a *net* extra charge of		5 00
For Iron Cock with Brass plug, add to list price		3 00

RAILROAD FORCE PUMP,

MOUNTED ON PLANK, AIR CHAMBER, WITH TWO DISCHARGES, ARRANGED FOR HAND POWER.

Fig. 148.

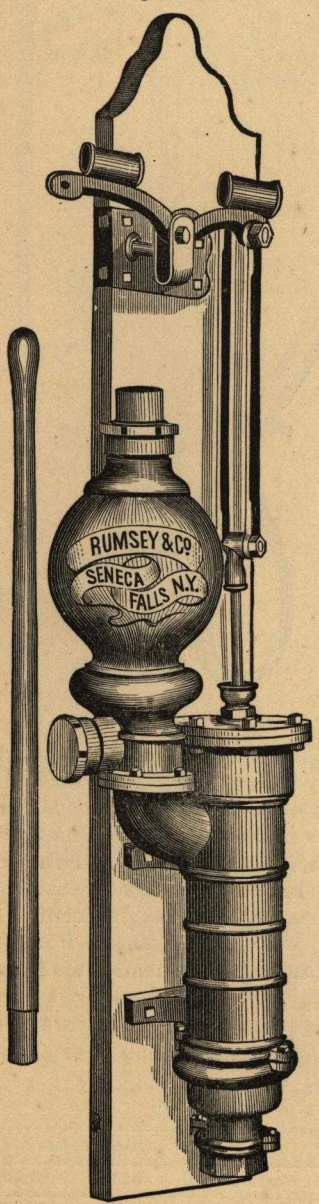


Fig. 148 shows a Railroad Force Pump similar to Fig. 146, but smaller. It is arranged for working by hand with wooden levers of sufficient length for two men to work at the same time. A spout to connect to the side discharge is furnished with the Pump, if desired. It is also fitted for hose and discharge pipe, which are sent when ordered.

With these appliances this Pump can at will and with ease be converted from a Force to a Well Pump, and from a Well Pump to a Fire Engine of no small capacity. With the power of one man a $\frac{3}{8}$ inch stream can be thrown to a horizontal distance of 80 feet.

It is always fitted for pumping cold water, unless otherwise ordered. If required for other uses, please specify in order.

SIZE, CAPACITY AND PRICE.

	Iron.	Brass.
No. 11, 4 inch cylinder, 10 inch stroke, capacity per stroke 0.27 gallon, for 2 inch pipes.....	$25 00	$60 00
For pumping hot liquids, extra price, net.....		10 00
We furnish cock with brass plug, extra list price		3 00

RAILROAD FORCE PUMP,

MOUNTED ON PLANK, AIR CHAMBER, WITH TWO DISCHARGES, Etc. ARRANGED FOR MACHINE POWER.

Fig. 149.

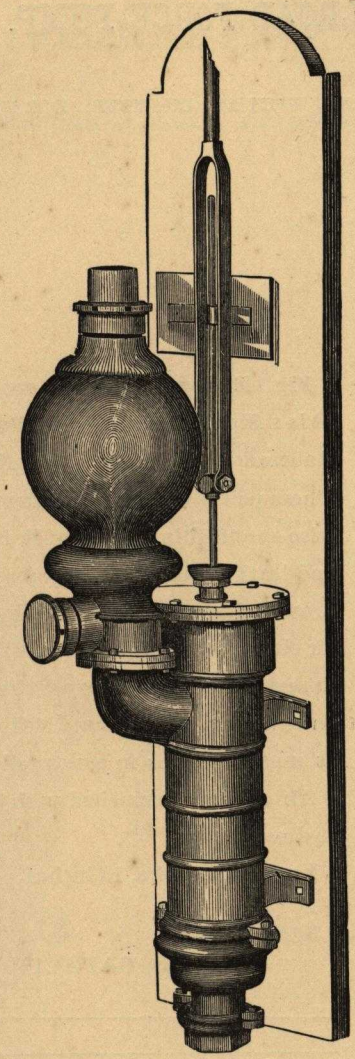


Fig. 149 shows the same Pump as Fig. 148, but arranged for Machine power from a crank. We can furnish all the necessary appliances for connecting the Pump to the power.

This Pump can also be rigged like Figs. 276 and 278, or can be attached to columns like Figs. 159, 160 and 260, and in either way they are a remarkably efficient Pump. Like all of this class of Pumps, it has very large water ways; the Cylinder is finely bored and polished, all the parts are bolted together through extra strong flanges, the pitman strap is of forged wrought iron, the rod, valves and stuffing box are of brass, and all put together in a thorough and workmanlike manner. We can fit up these Pumps with Cocks, if so desired. Can be run from 40 to 70 strokes per minute.

SIZE, CAPACITY AND PRICE.

	Iron.	Brass.
No. 11, 4 inch cylinder, 10 inch stroke, capacity per stroke 0.27 gallon, for 2 inch pipe.....	$26 00	$62 00
Fitted with Metallic Valves, etc., for hot liquids, extra price, net.....		10 00
We furnish Cock, with Brass Plug, extra list price....		3 00

RAILROAD FORCE PUMP,

MOUNTED ON PLANK, WITH AIR CHAMBER. FOR HAND USE.

Fig. 146.

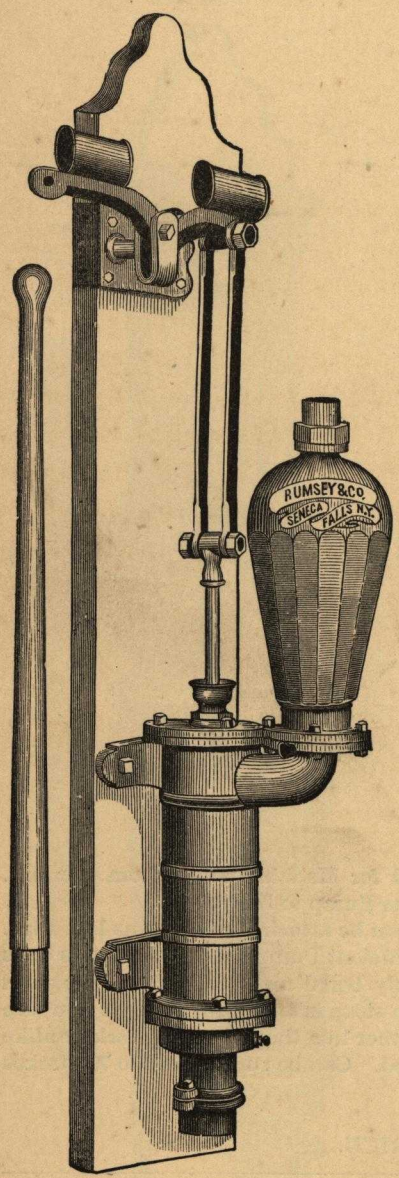


Fig. 146 shows a Pump of special strength and durability. It is a Single-Acting Force Pump, well adapted for use at Railroad Stations, or Factories, Mills, Breweries, etc., where power cannot conveniently be applied. If not otherwise specified in the order, it is fitted with leather valves and leather packed plunger for pumping cold water. It has brass rod, and guide (not shown in cut), and a capacious air chamber. All parts are bolted together through strong flanges, making it a very desirable Pump, in every respect. In ordering, please state if it is required for hot liquids, as many changes in construction become necessary.

Air chamber furnished with two discharges and spout, if so desired.

Length of stroke, 10 inches.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass.
No. 9, 5 inch cylinder, capacity per stroke 0.42 gallon, for 2 or 2½ inch pipe.....	$45 00	$126 00
Fitted with metallic valves and plunger for pumping hot liquids, add to list price.....		10 00

RAILROAD FORCE PUMP,

MOUNTED ON PLANK. FOR MACHINE POWER.

Fig. 147.

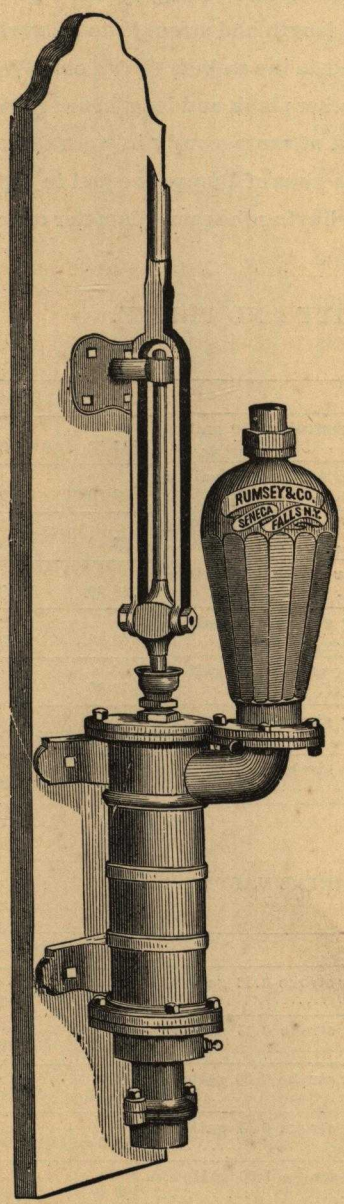


Fig. 147 shows the same Pump described under Fig. 146, but arranged for attachment to power driven crank, instead of the appliances for operating it by hand. When needed, we furnish the counter shaft, hangers, pulleys or gears, together with crank plate and pitman head, suitable for running this Pump. We can furnish it with air chamber having two discharge openings, with spout attached to the side opening. Fitted in this manner it is an unequaled Tank Pump, and as it has exceptionally large suction and discharge openings, it is specially adapted for Breweries, Distilleries, Tanneries, etc. We fit it for lead or iron pipe, as ordered

SIZE, CAPACITY AND PRICE.

	Iron.	Brass.
No. 9, 5 inch cylinder, capacity per stroke 0.42 gallon, for 2 or 2½ inch pipes	$45 00	$126 00
Fitted with Metallic Valves and Plunger for pumping hot liquids, add to list		10 00

Length of stroke, 10 inches. Can be run from 40 to 60 strokes per minute.

DOUBLE-ACTING RAILROAD FORCE PUMP,

MOUNTED ON PLANK, WITH WOODEN LEVERS, FOR HAND POWER.

Fig. 158.

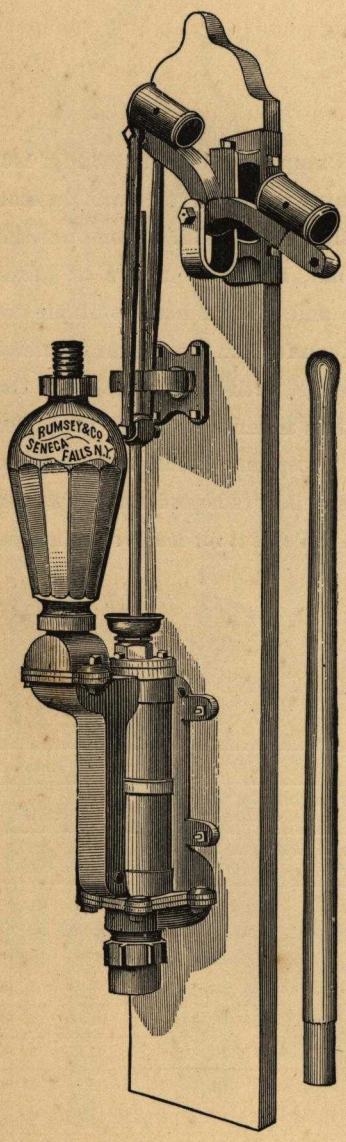


Fig. 158 represents the same Pump described under Fig. 157, fitted with the necessary appliances for working by hand power. The lever is of wood, of ample length and strength to be worked by one or two men, and is fitted to the sockets shown on "Walking Beam." By the use of another plank and lengthened pitman straps, this Pump may be used advantageously in wells of more than the ordinary depth. This class of Pumps is equal in capacity to two single-acting Pumps having the same diameter of bore.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass
No. 17, 2 inch cylinder, capacity per stroke 0.10 gallon, 1 inch pipe	$15 50	$ 28 00
No. 17, 2½ inch cylinder, capacity per stroke 0.17 gallon, 1¼ inch pipe	19 00	37 00
No. 17, 3 inch cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	23 00	50 00
No. 17, 3½ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	28 00	72 00
No. 17, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	42 00	97 00
No. 17, 4½ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	56 00	140 00
No. 17, 5 inch cylinder, capacity per stroke 0.67 gallon, 2½ inch pipe	78 00	168 00
No. 17, 6 inch cylinder, capacity per stroke 1.00 gallon, 3 inch pipe	98 00	198 00

WITH GUN METAL VALVES.

	Iron.	Brass.
No. 17, 3½ inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	$38 00	$ 76 00
No. 17, 4 inch cylinder, capacity per stroke 0.45 gallon, 2 inch pipe	53 00	102 00
No. 17, 4½ inch cylinder, capacity per stroke 0.50 gallon, 2 inch pipe	68 00	148 00
No. 17, 5 inch cylinder, capacity per stroke 0.67 gallon, 2½ inch pipe	88 00	178 00
No. 17, 6 inch cylinder, capacity per stroke 1.00 gallon, 3 inch pipe	123 00	218 00

We fit Fig. 158 with Gun Metal Valves, at same proportionate price as Fig. 151.

DOUBLE-ACTING RAILROAD FORCE PUMP,

MOUNTED ON PLANK. FOR POWER.

Fig. 157.

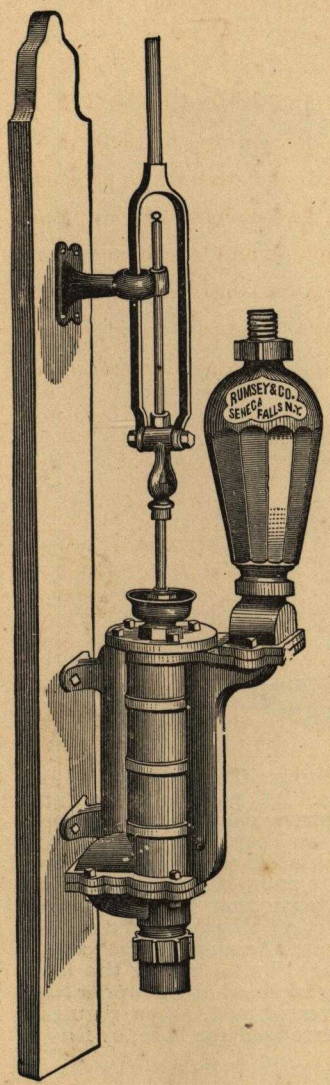


Fig. 157 represents a very efficient Double-Acting Force Pump, fitted for attaching to a crank driven by machine power. This Pump is made in the most thorough and workmanlike manner, both in principle and construction. It has an unusually large solid brass rod, with a heavily forged pitman attached, and all parts are firmly bolted through strong flanges, effectually preventing the possibility of leakage at any point. The air chamber can have one or two outlets, at the option of the purchaser.

For all places where a constant and rapid supply of water is required, we can unhesitatingly recommend it as a first-class Pump in every respect, and for steady and uniform action while in operation, it is unexcelled. It is admirably calculated for being driven by power, without the use of a balance wheel to regulate its motion. We furnish counter-shaft, crank, pulleys or gears, hangers, post boxes and pitman heads, for driving this Pump, at but a trifling advance on cost of labor and material. It is in extensive use in tanneries, factories, etc., and also for wind mill power.

SIZES, CAPACITY AND PRICES.

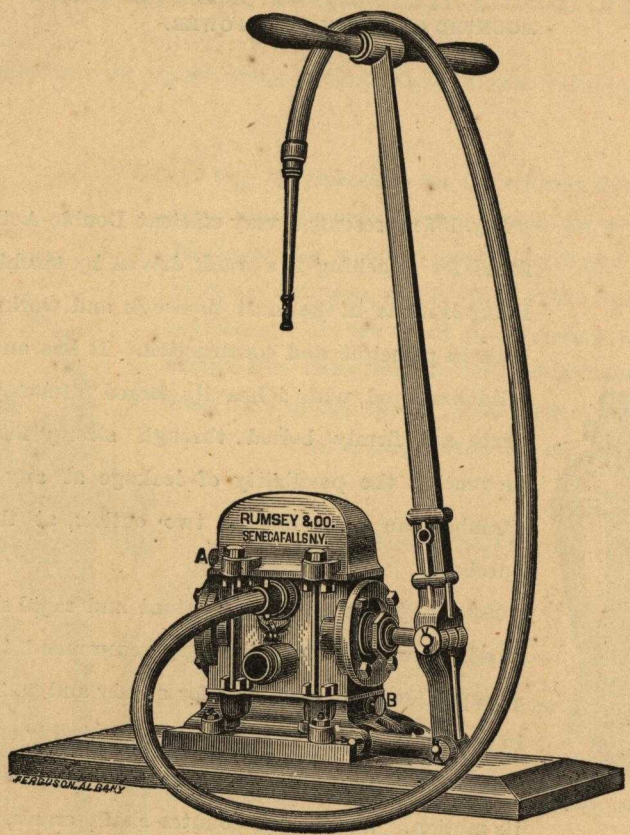
	Iron.	Brass.
No. 17, 2 in. cylinder, 8 in. stroke, capacity per stroke 0.10 gallon, strokes per min. 80, 1 in. pipe....	$ 17 50	$ 30 00
No. 17, 2½ in. cylinder, 8 in. stroke, capacity per stroke 0.17 gallon, strokes per min. 75, 1¼ in. pipe....	21 00	39 00
No. 17, 3 in. cylinder, 8 in. stroke, capacity per stroke 0.25 gallon, strokes per min. 70, 1¼ in. pipe....	25 00	52 00
No. 17, 3½ in. cylinder, 8 in. stroke, capacity per stroke 0.42 gallon, strokes per min. 60, 2 in. pipe....	30 00	74 00
No. 17, 4 in. cylinder, 8 in. stroke, capacity per stroke 0.44 gallon, strokes per min. 50, 2 in. pipe....	44 00	99 00
No. 17, 4½ in. cylinder, 8 in. stroke, capacity per stroke 0.50 gallon, strokes per min. 50, 2 in. pipe....	58 00	142 00
No. 17, 5 in. cylinder, 8 in. stroke, capacity per stroke 0.67 gallon, strokes per min. 40, 2½ in. pipe....	80 00	170 00
No. 17, 6 in. cylinder, 8 in. stroke, capacity per stroke 1.00 gallon, strokes per min. 40, 3 in. pipe....	100 00	200 00

All sizes above 3 inch cylinder are made with Gun Metal Valves for hot liquids, etc., when so ordered.

"EXCELSIOR" HORIZONTAL DOUBLE-ACTING SHIP PUMP,

WITH COPPER-LINED CYLINDER, ADJUSTABLE LEVER, VIBRATING FULCRUM, ETC.

Fig. 275.



The above cut represents our Double-Acting Horizontal Force Pump. The cylinder is lined with copper; the piston rod, valves and seats are made of bronze. All parts of this Pump exposed to the action of water are non-corrosive. It is compact, strong, simple, durable and unequaled by any Pump of the kind in use. It is especially valuable on board ships, for washing decks, wetting sails or extinguishing fires; and equally invaluable on wharves or around factories, mills, warehouses, livery stables, lumber yards, etc., for a fire pump and other purposes. The water ways are large and direct, and its general arrangement such that it can be easily overhauled. All water can be drawn out by simply unscrewing the let-off plugs, situated at each end of the cylinder for this purpose, thus rendering the Pump anti-freezing in the coldest latitudes. All the valves can be examined and removed, if necessary, by taking off the brass nuts of the four bolts holding all the parts together. A priming plug is placed at the upper back end of the cylinder, enabling the cylinder to be lubricated or the valves primed, when required. All appurtenances for fitting, etc., go complete with each Pump. Arranged for hose, or lead or iron pipe connections.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass.
No. 32, 3 inch cylinder, capacity per stroke 0.15 gallon, 1¼ inch pipe	$28 00	$58 00
No. 32, 4 inch cylinder, capacity per stroke 0.25 gallon, 1¼ inch pipe	32 00	60 00
No. 32, 5 inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	35 00	90 00
No. 32, 6 inch cylinder, capacity per stroke 0.60 gallon, 2½ inch pipe	45 00	120 00

DOUBLE LEVER.

	Iron.	Brass.
No. 32, 5 inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	$45 00	$ 95 00
No. 32, 6 inch cylinder, capacity per stroke 0.60 gallon, 2½ inch pipe	55 00	125 00

An iron wrench, fitting all nuts, stuffing gland and hose coupling, goes with each Pump.

Hose and play pipe for 3 and 4 in. cylinder, extra.	$6 00	Hose and play pipe for 5 and 6 in. cylinder, extra	$8 00

HORIZONTAL DOUBLE-ACTING "EXCELSIOR" FORCE PUMP,

COPPER LINED CYLINDER AND DOUBLE LEVERS.

Fig. 274.

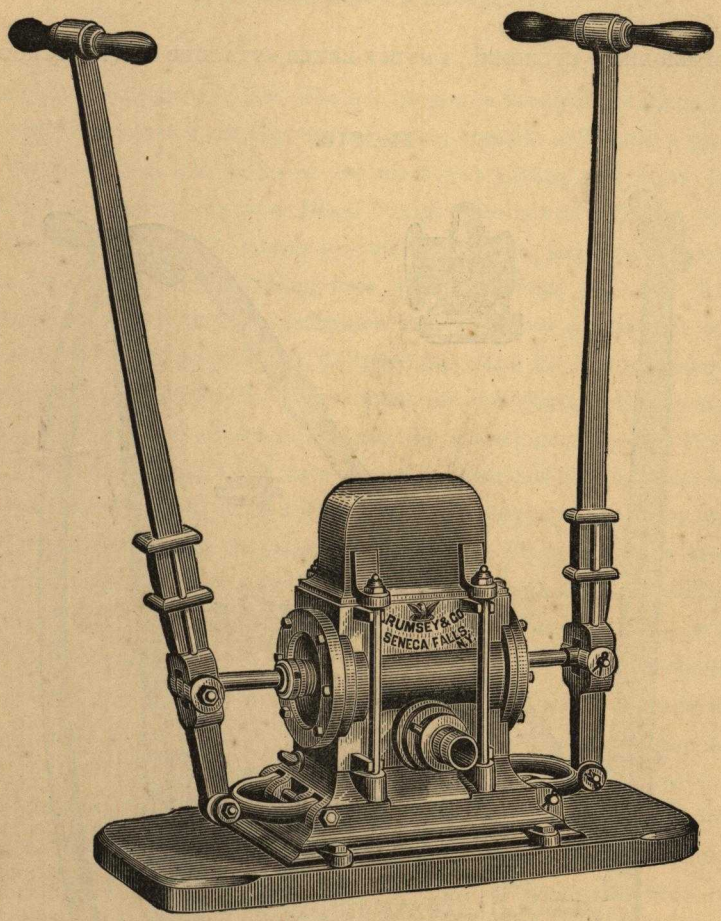


Fig. 274 shows our Horizontal Double-Acting Suction and Force Pump, arranged with fore and aft brakes, and of great power and efficiency. The iron Pumps have copper lined cylinders. The levers can be disconnected, so that the Pump can be worked with one lever, if desired. All the valuable features of construction contained in Fig. 275 are embodied in this Pump. The parts exposed to the action of salt water being made non-corrosive, it is particularly adapted for vessels making long voyages. Apparatus for fitting, etc., goes complete with each Pump.

SIZES, CAPACITY AND PRICES.

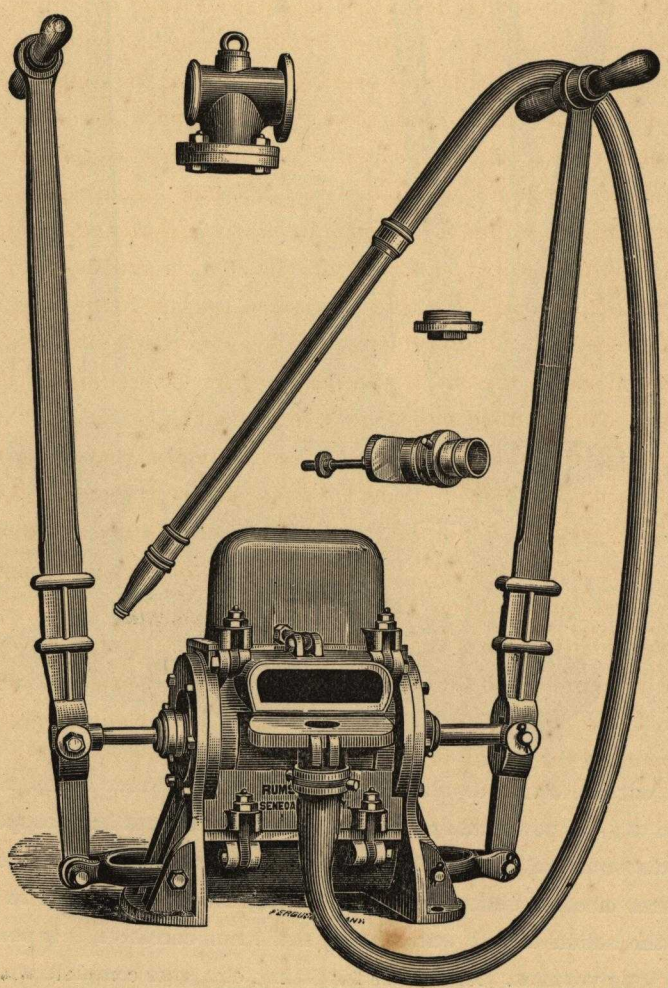
	Iron.	Brass.
No. 32, 5 inch cylinder, capacity per stroke 0.42 gallon, for 2 inch pipe	$45 00	$ 95 00
No. 32, 6 inch cylinder, capacity per stroke 0.60 gallon, for 2½ inch pipe	55 00	125 00
Four feet hose and discharge pipe, extra		8 00

Fitted for either hose, wrought iron or lead pipe, as desired. See page 600 for additional description of this Pump.

"ACME" DOUBLE-ACTING SUCTION AND FORCE PUMP COMBINED.

COPPER-LINED CYLINDER. DOUBLE LEVER ATTACHED TO PISTON ROD.

Fig. 319.



This cut exhibits our Double-Acting "Acme" Suction Pump, for elevating large quantities of water from the holds of vessels, or from wells, cisterns, reservoirs, etc. It is essentially a Brass Pump, as the Cylinder is lined with Brass or Copper, as desired, and most of the nuts and all of the thumb-screws are of Brass, while the Piston Rod, Valves and their Seats are made of best composition.

"ACME" DOUBLE-ACTING SUCTION AND FORCE PUMP COMBINED—Continued.

By simply raising the discharge plate (which is hinged to the spout) to its position, this Pump can be instantly converted into a very powerful Engine, capable of forcing a good-sized stream of water a long distance, thus combining in one machine a Lifting and Force Pump whenever required. On shipboard this can be set as Bilge Pumps usually are, with the iron suction pipe extending into the hold, and by the simple operation of raising the hinged plate to its place, a Force Pump can be had for extinguishing fires, washing decks, etc. One Pump, therefore, performs the functions of two, and we guarantee that in either capacity it will give all the satisfaction that either of two Pumps would, designed especially for only one purpose.

A little explanation will suffice to demonstrate the superiority and practicability of our device: The elbow E, with cap C (which screws into the elbow), go with each Pump as a Suction or Bilge Pump. The discharge plate P is, as before stated, fastened to the Pump; is always ready for use, and can be changed from a Lifting Pump to a Force Pump, and vice versa, instantaneously. A half coupling, not shown in the cut, is also furnished for using in suction hose, for pumping other than from hold, which is fitted into elbow E in such a manner as to cut off communication with the bilge. Packing rings are furnished with each Pump, so that water or air-tight joints can be made. PI is a sounding plug in elbow E for the purpose of sounding the bilge, or letting the water down in frosty weather to prevent freezing One or both levers can be disconnected by removing the split keys at 1, 2, 3 and 4. Under the air chamber (which may be detached by simply loosening the nuts on the hinge bolts) lie the upper or discharge valves, accessible for repairs, while by loosening the nuts of the four hinge bolts which connect the cylinder to the bed plate, the bed plate drops down and the lower or suction valves are exposed. The position of the Pump or pipes do not have to be disturbed in order to get at the valves to clean or repair them. We can heartily commend this Pump to our friends in the highest terms.

SIZE AND PRICE.

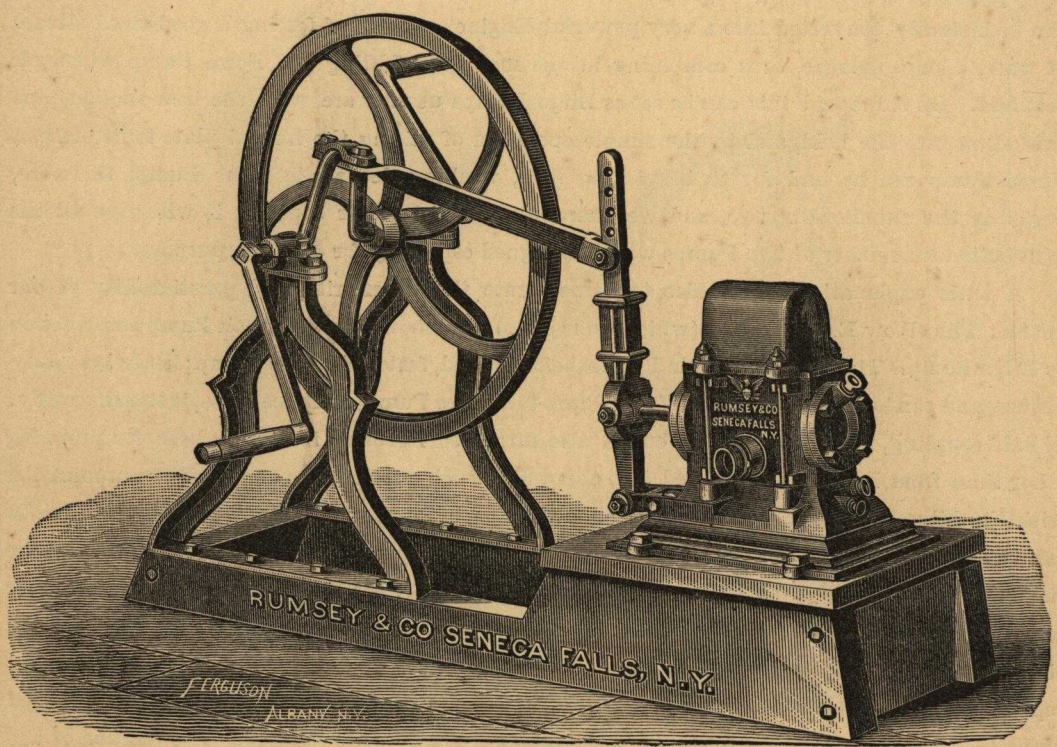
No. 34, 6 inch bore, 5 inch stroke	$56 00

Fitted for 2½ inch Suction Hose and 2 inch Discharge Hose. Can be fitted for Iron Pipe, when so ordered.

HORIZONTAL DOUBLE-ACTING "EXCELSIOR" FORCE PUMP,

MOUNTED ON FRAME, WITH BALANCE-WHEEL. FOR HAND OR POWER.

Fig. 315.



The cut shows our unequaled "Excelsior" Force Pump, mounted on a very substantial frame, with crank-shaft, side bearings, heavy balance-wheel, and winch handles or pulleys, adapting it equally well for hand or power. No more complete or better working device than this has ever been placed upon the market. The stroke can be changed in length by simply changing the pin from one hole to another, as shown on the upright lever. This Pump is the same in construction as Figs. 274, 275, 314 and 316. The side standards are of cast-iron, with long bearings for the steel crank-shaft; the connecting-rod is of the best wrought-iron, and so built that the lost motion produced by long and severe work can be easily taken up, all the parts being of ample strength to sustain any strain which can be put upon them in pumping. This arrangement is very convenient for a large variety of services. We especially recommend it for use in connection with our "Pony Power" for irrigation, watering stock, fire protection, etc.

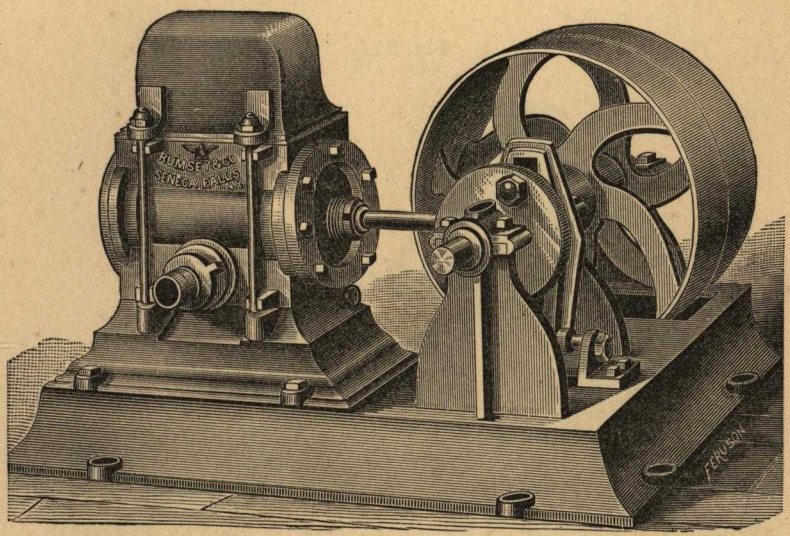
SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 1, 3 inch cylinder, capacity per stroke 0.15 gallon, 1¼ inch pipe	$65 00	$90 00
No. 2, 4 inch cylinder, capacity per stroke 0.25 gallon, 1½ inch pipe	73 00	105 00
No. 3, 5 inch cylinder, capacity per stroke 0.42 gallon, 2 inch pipe	90 00	140 00
No. 4, 6 inch cylinder, capacity per stroke 0.60 gallon, 2½ inch pipe	104 00	176 00

HORIZONTAL DOUBLE-ACTING "EXCELSIOR" SUCTION AND FORCE PUMP,

WITH CRANK SHAFT AND PULLEYS, FOR POWER.

Fig. 316.



The cut shows another adaptation of our "Excelsior" Force Pump for running by power from a belt. This is the most complete and compact Pump of the kind yet placed upon the market, and has no superior in point of construction. It is mounted on iron bed plate, with crank and turned tight and loose pulleys. All the valves are easily accessible by unscrewing the bolts and lifting off the air chamber, without disturbance to the suction pipe. The Pump is provided with brass plugs for emptying it in cold weather. The crank shaft is made of sufficient length to take a hand crank at either end, and is supported by strong bearings lined with anti-friction metal. The piston rod, valves and valve seats are all of gun metal, and all parts of the Pump liable to wear are made extra heavy and strong, to sustain severe and continued labor of long duration. They can be run from 40 to 80 revolutions per minute. If not otherwise ordered, we fit them for wrought iron pipe connections; but when desired, we arrange them for either hose or lead pipe without extra charge. For forcing water through hose for extinguishing fires, or for all general purposes and uses to which a Pump of this class is adaptable, we can confidently recommend it in the highest terms.

SIZES, CAPACITY AND PRICES.

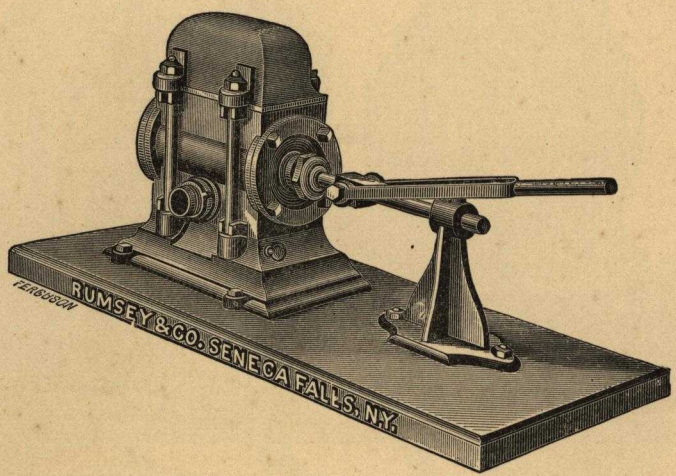
	Iron.	Brass.
No. 1, 3 inch cylinder, capacity per stroke 0.15 gallon, size of pipe 1¼ inch.....	$70 00	$100 00
No. 2, 4 inch cylinder, capacity per stroke 0.25 gallon, size of pipe 1½ inch.....	75 00	115 00
No. 3, 5 inch cylinder, capacity per stroke 0.42 gallon, size of pipe 2 inch, Geared.....	150 00	
No. 4, 6 inch cylinder, capacity per stroke 0.60 gallon, size of pipe 2½ inch, Geared.....	175 00	

An Iron Wrench, fitting all nuts, Stuffing Gland and Hose Coupling, goes with each Pump.

HORIZONTAL DOUBLE-ACTING "EXCELSIOR" FORCE PUMP,

WITH WROUGHT IRON PITMAN, BRONZE ROD AND GUIDE.

Fig. 314.



The above cut represents our "Excelsior" Force Pump, fitted with wrought iron pitman and bronze guide and rod, for attaching to power. For a more complete description of the general construction of this Pump, see Fig. 275. This is an excellent arrangement for filling tanks, or for fire purposes, and is also extensively in use at railway watering stations, for operating by horse power. It can safely be run at 50 revolutions per minute, and in cases of emergency at a much higher rate of speed. Fitted for gas pipe, unless otherwise ordered. The Iron Pumps have copper lined cylinders. An iron wrench, fitting all nuts, stuffing gland and hose couplings, accompanies each Pump. For suitable counter shafts, see Figs. 304 and 305.

SIZE, CAPACITY AND PRICE.

	Iron.	Brass.
No. 1, 3 inch cylinder, capacity per stroke 0.15 gallon, for 1¼ inch pipe	$30 00	$ 60 00
No. 2, 4 inch cylinder, capacity per stroke 0.25 gallon, for 1½ inch pipe	32 00	62 00
No. 3, 5 inch cylinder, capacity per stroke 0.42 gallon, for 2 inch pipe	47 00	91 00
No. 4, 6 inch cylinder, capacity per stroke 0.60 gallon, for 2½ inch pipe	50 00	123 00

Length of stroke, 5 inches.

HORIZONTAL DOUBLE-ACTING SUCTION AND FORCE PUMP,

MOUNTED ON PLANK, WITH GUIDE, BRONZE ROD, ETC.

Fig. 306.

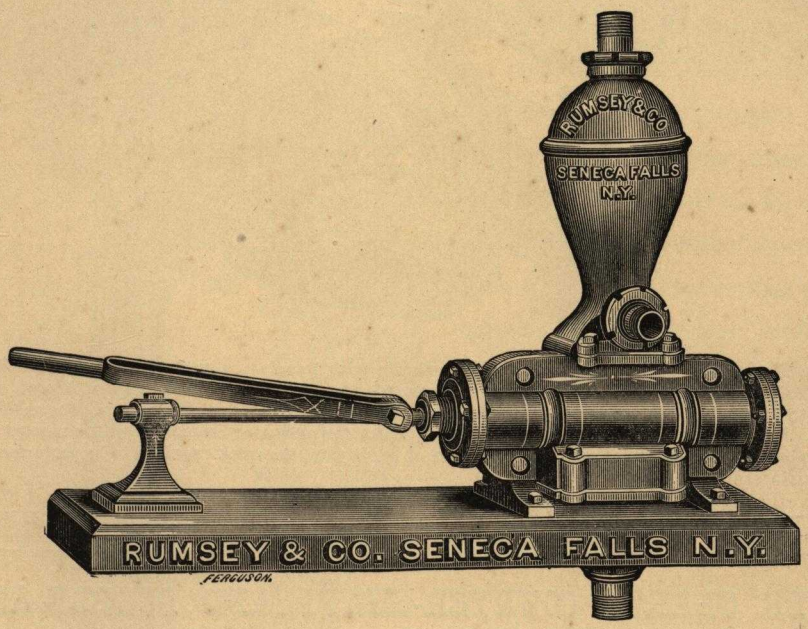


Fig. 306 shows our Improved Double-Acting Horizontal Suction and Force Pump, particularly adapted for the application of power direct from a water wheel or other machinery. It is thoroughly made of the best materials, and will be found very efficient for irrigation, general farm and plantation service, or any other service where a first-class Horizontal Pump can be used. It has wrought-iron pitman and bronze rod. The valves are easy of access and readily replaced. We furnish crank-shaft and pulleys to run this Pump when ordered, and can make it with metal valves at small extra charge. These Pumps are also largely used at railroad watering stations, tanneries, etc., in connection with our Horse Power.

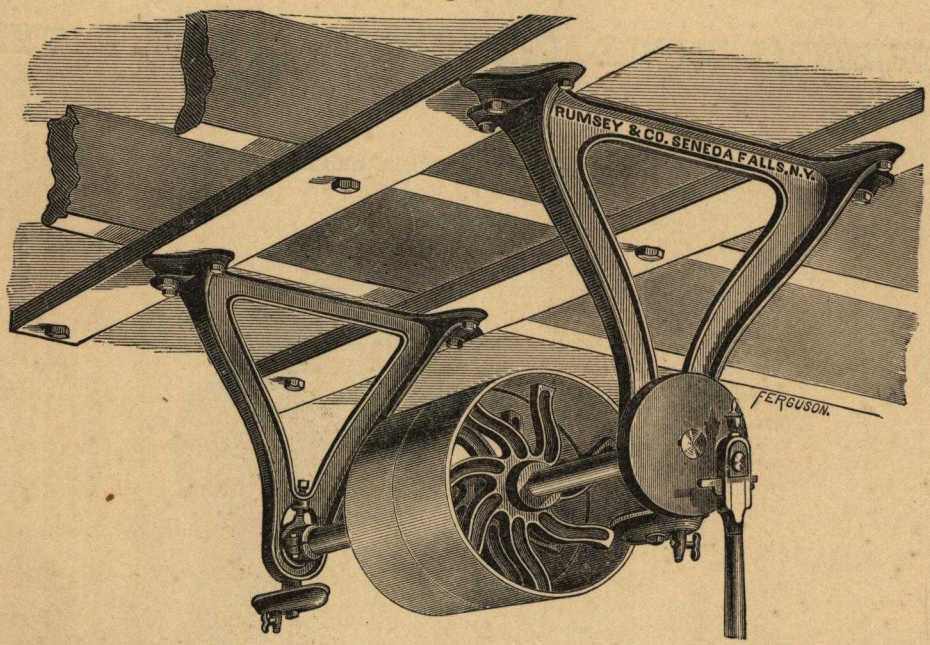
SIZES, CAPACITY AND PRICES.

No. 1, 2½ inch Cylinder, capacity per stroke 0.16 gallon, size of pipe 1¼ inch	$25 00
No. 2, 3 inch Cylinder, capacity per stroke 0.25 gallon, size of pipe 1¼ inch	35 00
No. 3, 3½ inch Cylinder, capacity per stroke 0.42 gallon, size of pipe 1¼ inch	45 00
No. 4, 4 inch Cylinder, capacity per stroke 0.43 gallon, size of pipe 1¼ inch	55 00
No. 5, 4½ inch Cylinder, capacity per stroke 0.50 gallon, size of pipe 1¼ inch	65 00

COUNTER-SHAFT,

WITH HANGERS, CRANK PLATE, GIB AND KEY CONNECTIONS, ETC.

Fig. 305.



The above Fig. represents another of our Counter-Shafts with hangings complete, having Gib and Key "Stub" attached. This is a very strong and convenient arrangement for operating the smaller class of Pumps, such as Fig. 62, up to 3-inch Cylinder, Fig. 157, up to 3¼-inch Cylinder, Fig. 287, 3 and 3½-inch Cylinders. See mode of connection shown in cut. Special prices will be made on Counter-Shafts for operating larger Pumps, on receipt of information upon which to base our calculations, such as the size of the Pump, the work required to be performed, the size and speed of the main shaft, etc.

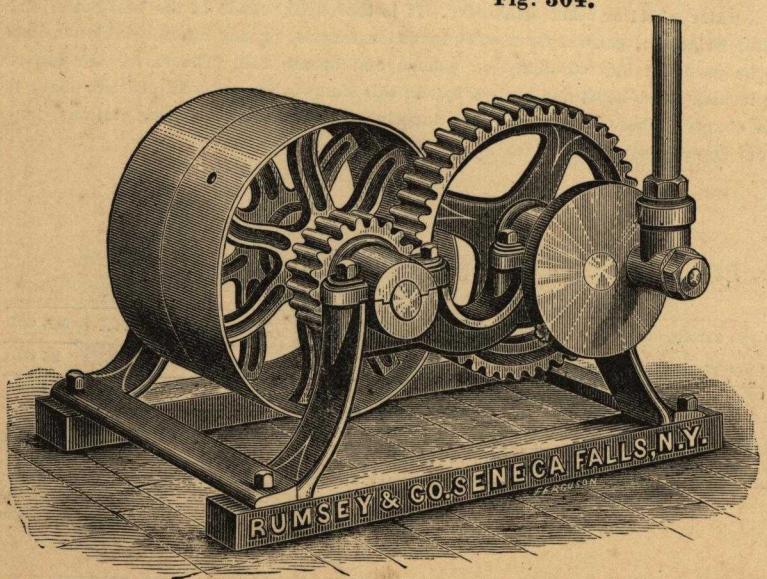
PRICES.

Fig. 305, with Pulleys 18 inches in diameter and 5 inch face	$35 00

POWER GEARED COUNTER-SHAFT AND DOUBLE-ACTING FORCE PUMP ON COLUMN,

MOUNTED WITH GIB AND KEY CONNECTIONS, CRANK PLATE, ETC.

Fig. 304.



The accompanying cut represents a strong and powerful Counter-Shaft for operating Force Pumps. They are of ample strength and sufficient power to operate large Pumps.

PRICE.

Pulleys 14 inches diameter and 4 inch face	$50 00

IRON COLUMN FORCE PUMP,

WITH ONE DOUBLE-ACTING FORCE PUMP.

Fig. 159.

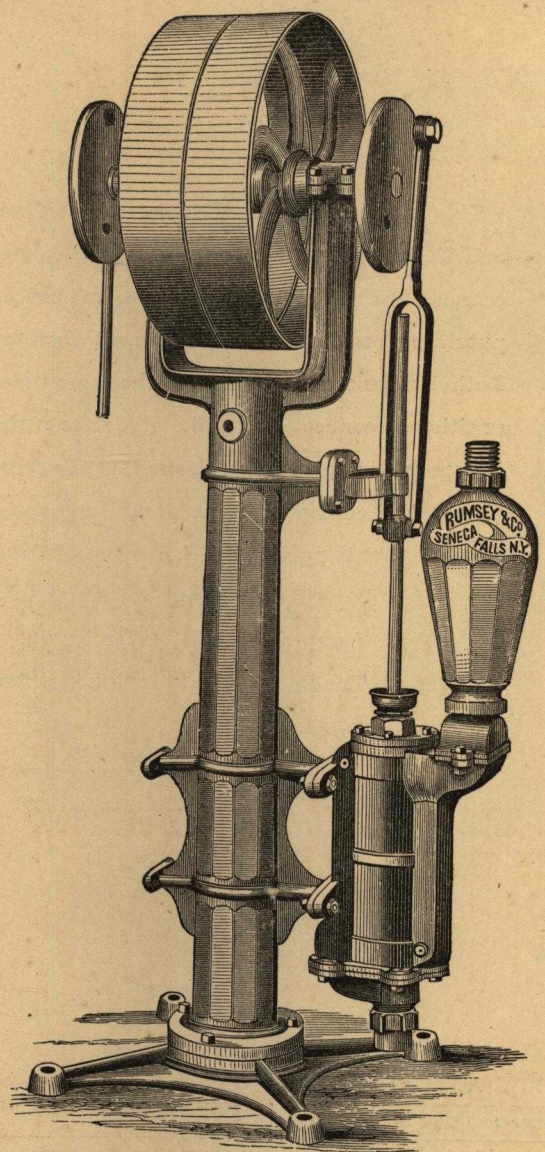


Fig. 159 represents an Iron Column, having countershaft, crank, tight and loose pulleys, wristpin and pitman, with one Double-Acting Force Pump, like Fig. 157, attached and ready for use. This is the most complete, substantial and compact Power Force Pump in use, requiring comparatively no labor or expense to set up ready for action, having simply to be bolted down to the floor, when it is ready for connecting the pipes and applying the belt for use. In all respects it is the simplest and best device of the kind yet placed upon the market. The pulleys are 20 inches in diameter and have 4½ inches face. The pitman-head has gib and key connections, similar to the "stub ends" of steam engines. A boiler-feeding Pump can be attached instead of the double-acting Pump—an arrangement that will commend itself to engineers of stationary engines. Each pulley is provided with set-screws, so that both may be made "tight," if necessary.

SIZES, CAPACITY AND PRICES.

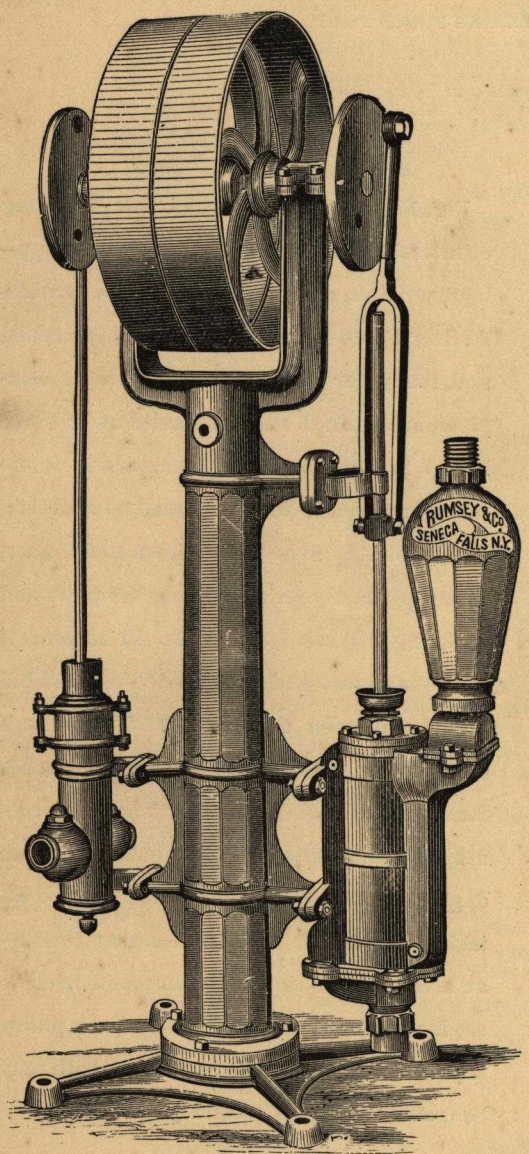
DOUBLE-ACTING FORCE PUMP.	Iron.	Brass.
No. 18, 2 inch cylinder, capacity per stroke 0.10 gallon, for 1 inch pipe	$ 70 00	$ 86 00
No. 18, 2½ inch cylinder, capacity per stroke 0.16 gallon, for 1¼ inch pipe	75 00	89 00
No. 18, 3 inch cylinder, capacity per stroke 0.25 gallon, for 1½ inch pipe	85 00	106 00
No. 18, 3½ inch cylinder, capacity per stroke 0.42 gallon, for 2 inch pipe	100 00	144 00
No. 18, 4 inch cylinder, capacity per stroke 0.43 gallon, for 2 inch pipe	120 00	172 00
No. 18, 4½ inch cylinder, capacity per stroke 0.50 gallon, for 2 inch pipe	140 00	224 00

We can furnish the above with Two Double-Acting Pumps, if desired, at an additional cost of one Extra Pump.
See page 610.

IRON COLUMN FOR TWO PUMPS,

ARRANGED WITH TIGHT AND LOOSE PULLEYS.

Fig. 160.



This is a complete combination of the Tank and Boiler Feed Pump, with heavy bed-plate, compact and perfect in all its parts, and can be put into operation with the utmost facility. Both Pumps can be worked at the same time, or either disconnected at will. The sizes of the Pumps can be reversed, if desired, at the same price. Any change in the order of Pumps will be made to suit purchasers—*i. e.*, a small Tank Pump and large Boiler Pump are equal to a large Tank Pump and small Boiler Pump, or vice versa. The Pulleys are 20 inches in diameter, and have 4½ inches face.

SIZES, CAPACITY AND PRICES.

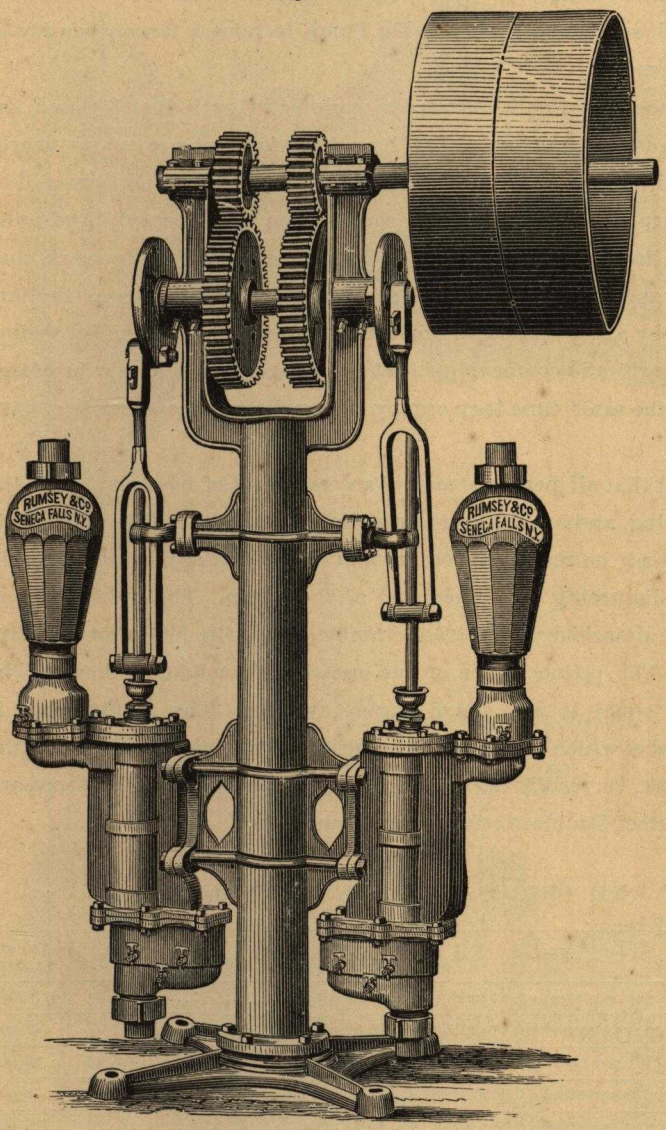
One Double-Acting Force Pump and One Boiler Pump.	Iron.
No. 19, One 2⅝ inch Pump, capacity per stroke 0.16 gallon, and 2 inch Pump for 20 horse-power boiler.....	$100 00
No. 19, One 3 inch Pump, capacity per stroke 0.25 gallon, and 2½ inch Pump for 34 horse-power boiler.....	130 00
No. 19, One 3⅓ inch Pump, capacity per stroke 0.42 gallon, and 2⅝ inch Pump for 34 horse-power boiler.....	135 00
No. 19, One 4 inch Pump, capacity per stroke 0.43 gallon, and 3 inch Pump for 52 horse-power boiler.....	165 00
No. 19, One 4½ inch Pump, capacity per stroke 0.50 gallon, and 4 inch Pump for 80 horse-power boiler.....	180 00

Two Double-Acting Force Pumps, or Two Boiler Pumps.	Iron.	Brass.
No. 19, Two 2⅝ in. Pumps, capacity per stroke 0.33 gal., or two 2 in. Pumps for 40 horse-power boiler	$ 95 00	$123 00
No. 19, Two 3 in. Pumps, capacity per stroke 0.50 gal., or two 2½ in. Pumps for 65 horse-power boiler	110 00	152 00
No. 19, Two 3⅓ in. Pumps, capacity per stroke 0.85 gal., or two 3 in. Pumps for 100 horse-power boiler	140 00	228 00
No. 19, Two 4 in. Pumps, capacity per stroke 0.88 gal., or two 3⅓ in. Pumps for 140 horse-power boiler	175 00	289 00
No. 19, Two 4½ in. Pumps, capacity per stroke 1.00 gal., or two 4 in. Pumps for 160 horse-power boiler	205 00	373 00

DOUBLE-GEARED IRON COLUMN,

WITH TIGHT AND LOOSE PULLEYS, AND OUTSIDE BEARING.

Fig. 260.



The cut shows a very compact and powerful combination of two double-acting Force Pumps, bolted to a strong cast-iron column, being easily set up, and of the highest efficiency in operation. Our arrangement of gearing and pulleys secures the maximum of work with the minimum of power. Many of the largest Paper Mills, Distilleries, etc., in the country have from one to four of them in successful operation. The pulleys are 16 inches in diameter and have a belt face of 6 inches. The gears are 12 inches in diameter, 2 inches face and 1 inch pitch, while the pinions are 6 inches in diameter, with same face and pitch as the gears. These Pumps may be changed to Boiler Feeding Pumps up to 4 inches diameter, at same prices. The proper speed at which they should be run varies with the size of the Pump—from 30 to 60 revolutions per minute.

SIZES, CAPACITY AND PRICES.

	Iron.	Brass.
No. 1, Two 3 inch Double-Acting Pumps, capacity per stroke 0.50 gallon	$130 00	$186 00
No. 2, Two 3½ inch Double-Acting Pumps, capacity per stroke 0.85 gallon	165 00	244 00
No. 3, Two 4 inch Double-Acting Pumps, capacity per stroke 0.87 gallon	200 00	282 00
No. 4, Two 4½ inch Double-Acting Pumps, capacity per stroke 1.00 gallon	230 00	360 00
No. 5, Two 5 inch Double-Acting Pumps, capacity per stroke 1.33 gallon	280 00	450 00
No. 6, Two 6 inch Double-Acting Pumps, capacity per stroke 2.00 gallon	360 00	550 00

DOUBLE-ACTING PACIFIC RAILROAD FORCE PUMP,

ARRANGED FOR HAND OR POWER.

The following Figs., 171, 279, 172 and 173, represent styles of our Double-Acting Force Pumps, designed especially for the use of railroad corporations, distillers, paper mills, etc., or for other parties who require a very powerful, substantial and reliable Pump to raise a large quantity of water for fire protection or other purposes.

The great increase in the number of establishments for manufacturing industries, and the consequent demand for all labor saving appliances, has brought into existence many nearly worthless Pumps—designed, it would seem, in ignorance of true mechanical proportions and in disregard of the principles and purposes necessary in the construction of a successful hydraulic engine. We will stake our reputation as manufacturers of Pumps for the last forty years, that the machines we here illustrate and describe, are not surpassed in material, construction, durability, efficiency and economy by any Pump in the market. They are handsome in design, and so arranged with regard to strength and compactness that any danger of accident or breakage is reduced to a minimum, while at the same time they occupy the smallest space consistent with the necessary strength.

These Pumps are so constructed that all parts are easy of access in case of necessity. All the valves are bronze with a rubber facing, and are the best variety of poppet valve. The valve seats are also of bronze, screwed in, and can be readily taken out and replaced at any time by simply removing the face plate, without disturbing any other part of the Pump. The induction and eduction pipes can be attached or detached without any trouble, as all the joints are in plain sight on the front of the Pump. The piston rod is of gun metal, with solid cross head. The cylinders are bored and polished equal to any steam engine cylinder. The stuffing box is surrounded by an oil or water chamber which prevents the admission of air into the Pump on the downward stroke. It will, therefore, be readily seen that these Pumps combine the necessary attributes to make them always perfect Double-Acting Force Pumps.

SIZES, CAPACITY AND PRICES. (Figs. 171, 279, 172 and 173.)

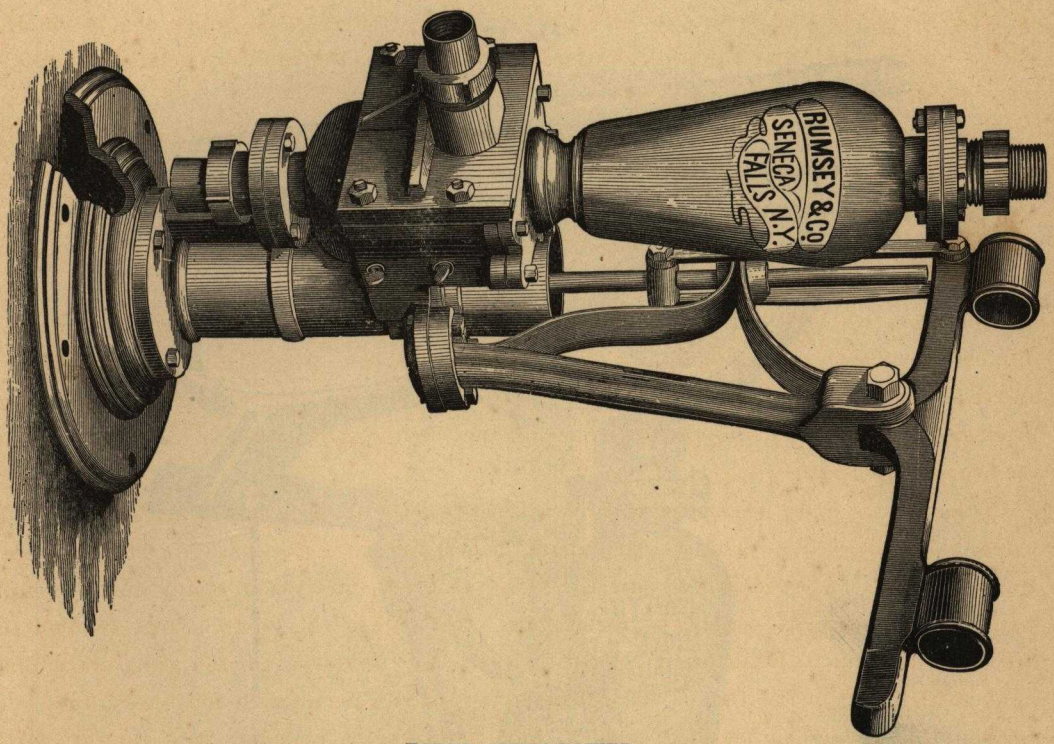
	Iron.	Brass Lin. Cyl.
No. 26, 3 inch cylinder, 8 inch stroke, capacity per stroke 0.25 gallon, 1¼ inch pipe	$ 65 00	$ 75 00
No. 26, 3 inch cylinder, 10 inch stroke, capacity per stroke 0.33 gallon, 1¼ inch pipe	70 00	78 00
No. 26, 3 inch cylinder, 12 inch stroke, capacity per stroke 0.35 gallon, 1¼ inch pipe	72 00	80 00
No. 26, 4 inch cylinder, 8 inch stroke, capacity per stroke 0.40 gallon, 2 inch pipe	75 00	79 50
No. 26, 4 inch cylinder, 10 inch stroke, capacity per stroke 0.56 gallon, 2 inch pipe	95 00	101 00
No. 26, 4 inch cylinder, 12 inch stroke, capacity per stroke 0.63 gallon, 2 inch pipe	100 00	111 00
No. 26, 4 inch cylinder, 14 inch stroke, capacity per stroke 0.75 gallon, 2 inch pipe	110 00	125 00
No. 26, 5 inch cylinder, 8 inch stroke, capacity per stroke 0.65 gallon, 2½ inch pipe	90 00	110 00
No. 26, 5 inch cylinder, 12 inch stroke, capacity per stroke 1.20 gallon, 2½ inch pipe	110 00	118 00
No. 26, 5 inch cylinder, 14 inch stroke, capacity per stroke 1.25 gallon, 2½ inch pipe	130 00	165 00
No. 26, 6 inch cylinder, 8 inch stroke, capacity per stroke 1.00 gallon, 3 inch pipe	110 00	135 00
No. 26, 6 inch cylinder, 14 inch stroke, capacity per stroke 1.70 gallon, 3 inch pipe	175 00	215 00
No. 26, 8 inch cylinder, 10 inch stroke, capacity per stroke 2.16 gallon, 4 inch pipe	275 00	225 00

Fig. 172, with Folding Brakes, extra, $20.00.

DOUBLE-ACTING PACIFIC RAILROAD FORCE PUMP,

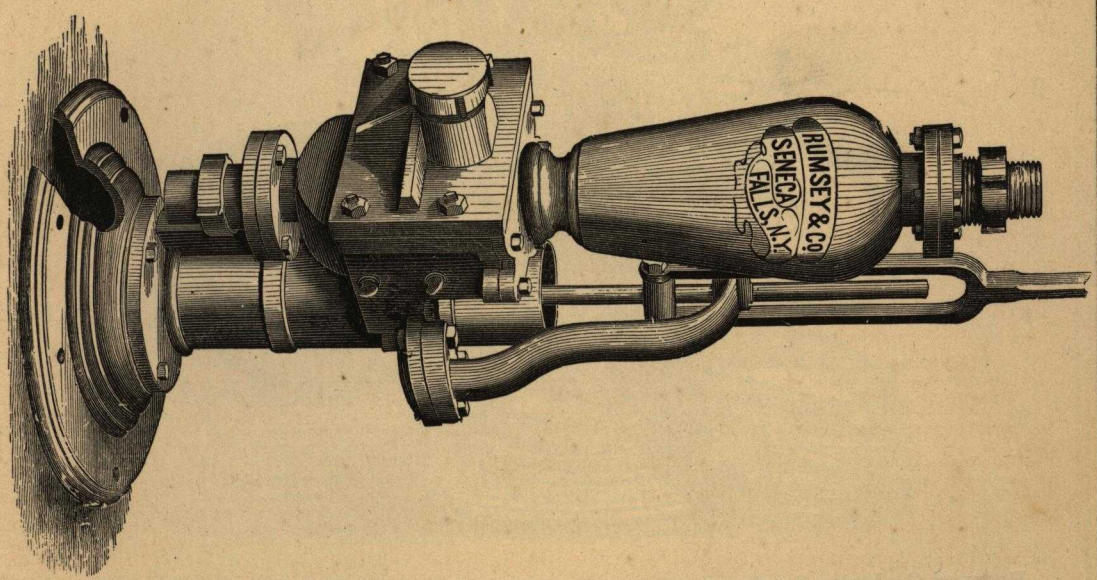
FOR HAND POWER.

Fig. 171.



FOR MACHINE POWER.

Fig. 279.

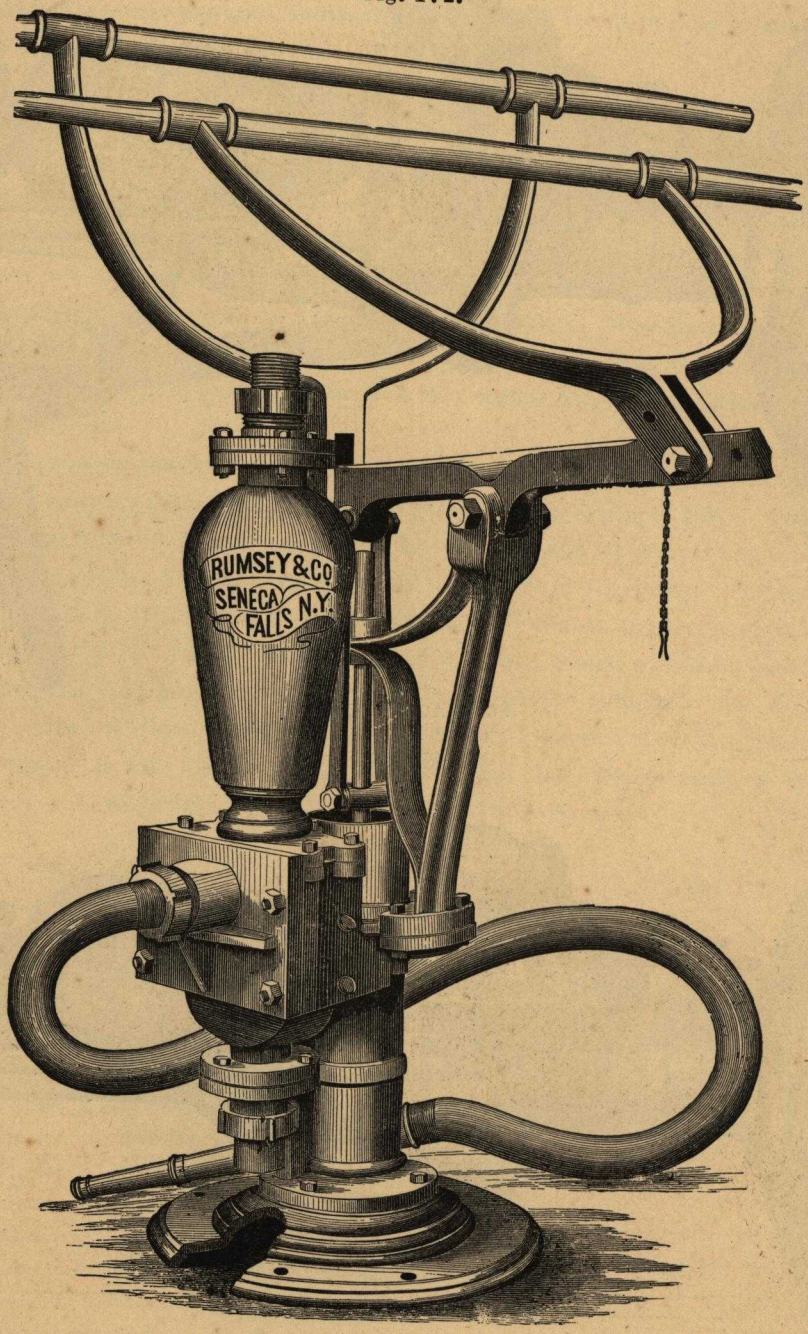


See description and price on page 612.

PACIFIC RAILROAD FIRE PUMP,

WITH FOLDING BRAKES.

Fig. 172.

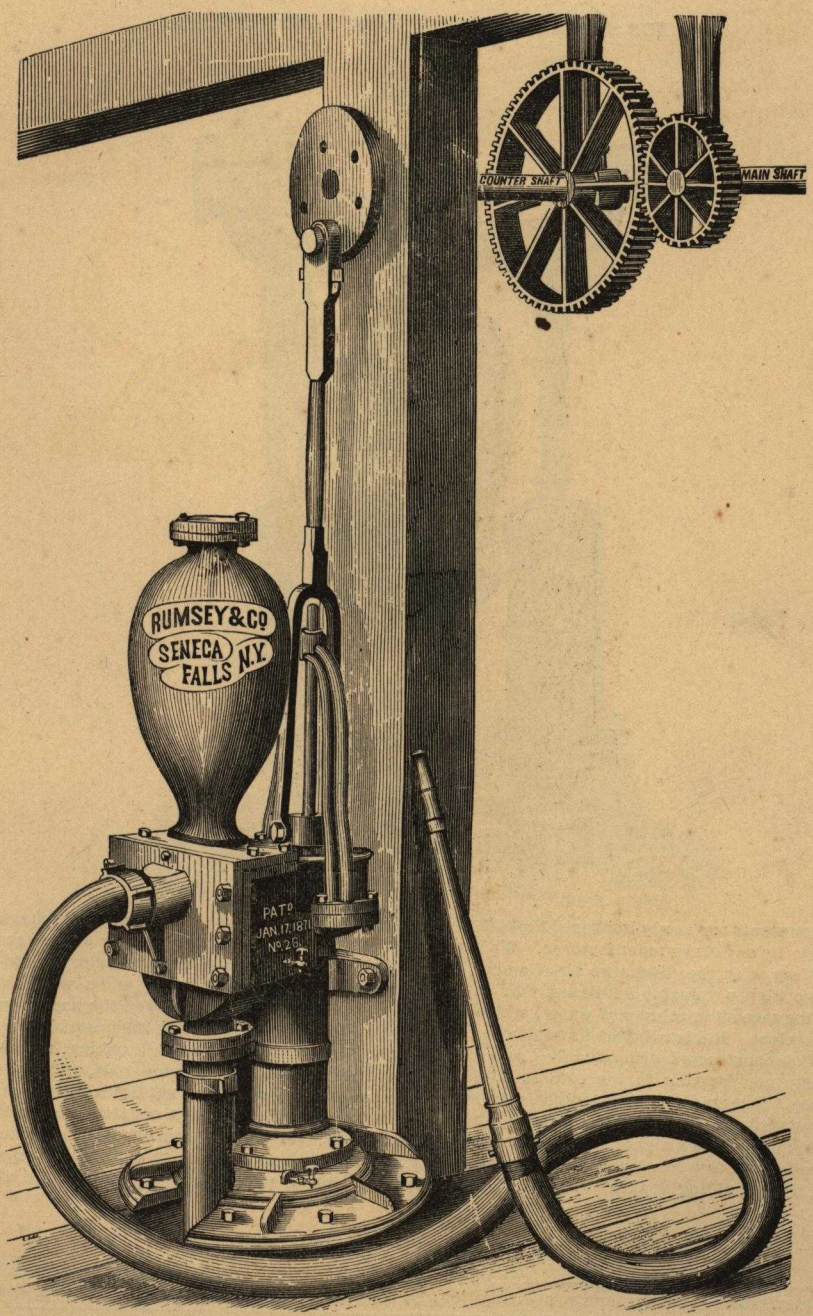


Room on the brakes for six or eight men. Equal to ordinary Fire Engine. For description and price of these Pumps, see page 612. Arranged with Folding Brakes, as shown, add $20.00 to list price.

PACIFIC RAILROAD FORCE PUMP,

FOR MACHINE POWER.

Fig. 173.



Gearing, Shaft and Hangers, with Face Plate and Pitman, Hose, Discharge Pipe, etc., furnished, when ordered, at an extra charge. For description, prices, etc., see page 612.

IMPROVED CLOSE-TOP TWO-CYLINDER FORCE PUMP,

FOR STEAMBOATS, FACTORIES, RAILROADS, ETC.

Fig. 261.

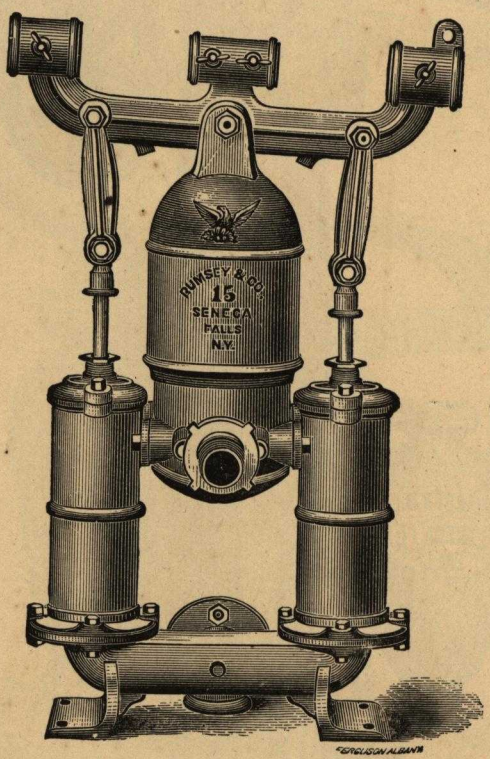


Fig. 261 represents our newly Improved Close-Top Two-Cylinder Force Pump. It combines advantages not contained in Pumps made by any other manufacturer. We now construct it with a vacuum chamber on the suction, which is cast in one piece with the discharge air-chamber, and bolted to the bed-plate directly under the air-chamber, thus combining two highly valuable additions, viz: A strong support to the air-chamber, and a *cushion of air* to receive the shock of the ascending column of water, which otherwise would expend its force upon the suction valves and soon render them useless. Rubber Buffers have also been added to ease the concussion from the beam at the termination of the stroke. It is constructed with *trip valves*, and plug in the bottom of the air-chamber, making it, with only ordinary care, absolutely non-freezing in the coldest climate. It contains brass-cased piston-rods, with valves and stuffing glands of brass. It is scientific in principle, simple in construction and action, and not liable to get out of order. The water passages are large and direct, and nothing throughout its construction has been omitted in material or workmanship that would bring it to a higher standard of perfection than has ever before been attained in Force Pumps. With each Pump we furnish two wooden levers of ample length and strength to work it to the fullest capacity. We also make it with iron "Folding Brakes," like Fig. 172; the brakes being of ample length for eight or ten men to work.

SIZES, CAPACITY AND PRICES.

No. 15, 3 inch cylinder, capacity per stroke 0.19 gallon, 1½ inch pipe, 1¼ inch hose.....	$ 40 00	$ 60 00
No. 15, 4 inch cylinder, capacity per stroke 0.35 gallon, 2 inch pipe, 1½ inch hose.....	55 00	80 00
No. 15, 5 inch cylinder, capacity per stroke 0.56 gallon, 2½ inch pipe, 2 inch hose.....	70 00	95 00
No. 15, 6 inch cylinder, capacity per stroke 0.87 gallon, 3 inch pipe, 2 inch hose.....	100 00	155 00

Iron Folding Brakes, extra, $20.00.

OPEN-TOP TWO-CYLINDER FORCE PUMP,

FOR STEAMBOATS, SAILING VESSELS, FACTORIES, WHARVES, ETC., WITH WOODEN LEVERS.

Fig. 151.

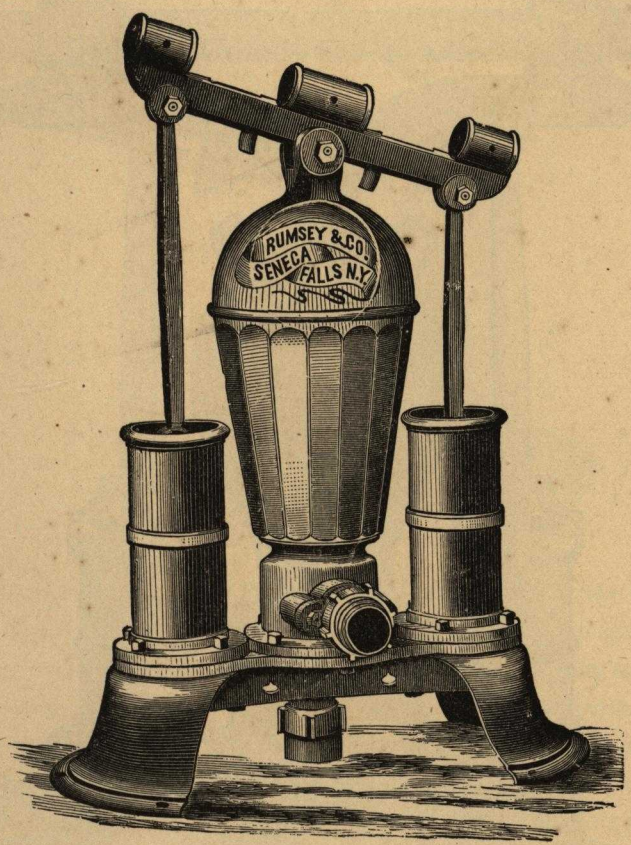


Fig. 151 but inadequately represents our Double-Acting Force Pump, many improvements having been added, and consequent changes in appearance made, since the cut was designed. The air-chamber is now greatly enlarged and made more attractive in form. Rubber Buffers on each side of the air-chamber receive the blow of the walking-beam in its downward stroke. It is specially desirable where a perfectly reliable Deck Pump is wanted on steam or sailing vessels, or as a stationary Fire Engine in factories, etc., at a reasonable price. For the latter purpose Folding Brakes are added, as shown in Fig. 153. While shown above for hand use, it can be easily adapted to machine power.

SIZES, CAPACITY AND PRICES.

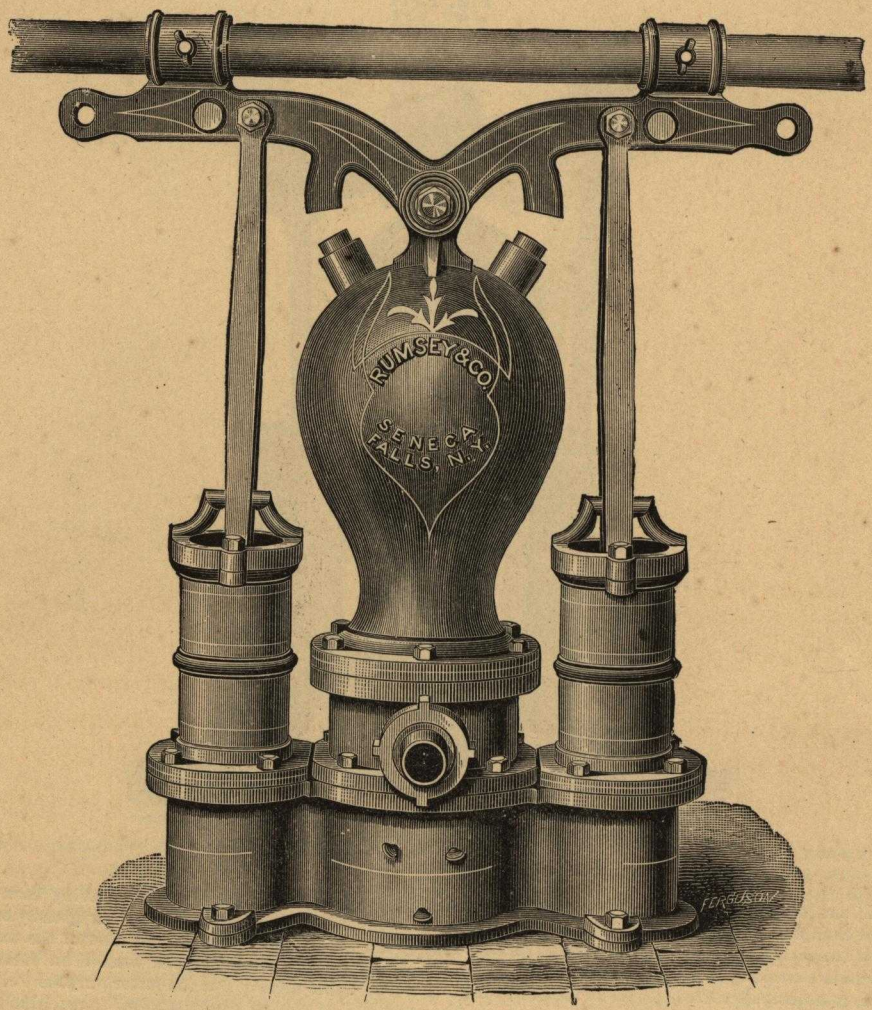
	Iron.	Copper Lined Cyl.	Brass Cyl.
No. 12, 3 inch Cylinder, capacity per stroke 0.19 gallon, 1½ inch pipe.....	$35 00	$42 00	$45 00
No. 12, 4 inch Cylinder, capacity per stroke 0.35 gallon, 2 inch pipe.....	40 00	47 00	55 00
No. 12, 5 inch Cylinder, capacity per stroke 0.56 gallon, 2½ inch pipe.....	55 00	69 00	80 00
No. 12, 6 inch Cylinder, capacity per stroke 0 87 gallon, 3 inch pipe.....	75 00	91 00	105 00

Fitted with Folding Brakes, extra list, $20.00.

OPEN TOP TWO-CYLINDER FORCE PUMP,

FOR STEAMBOATS, RAILROADS, FACTORIES, WHARVES, Etc., WITH METALLIC VALVES AND WOODEN LEVERS.

Fig. 152.



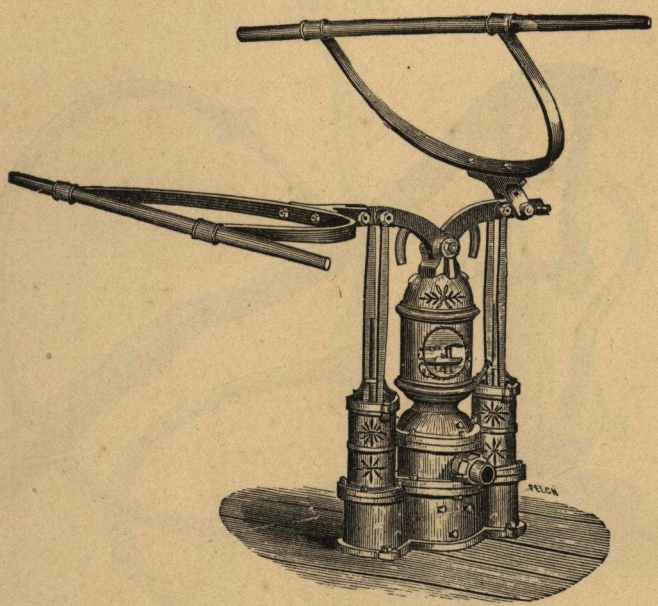
SIZES, CAPACITY AND PRICES.

	Iron.	Cop. Lined Cylinder.	Brass Cyl.
No. 1, 3 inch cylinder, capacity per stroke 0.19 gallon, for 1¼ inch pipe	$50 00	$57 00	$65 00
No. 2, 4 inch cylinder, capacity per stroke 0.35 gallon, for 2 inch pipe	60 00	68 00	80 00
No. 3, 5 inch cylinder, capacity per stroke 0.56 gallon, for 2½ inch pipe	75 00	87 00	100 00
No. 4, 6 inch cylinder, capacity per stroke 0.87 gallon, for 3 inch pipe	85 00	98 00	120 00
With Spring Packing on Plungers, for hot liquids, extra			10 00

TWO-CYLINDER DOUBLE-ACTING FORCE PUMP,

WITH METALLIC VALVES AND WROUGHT IRON FOLDING BRAKES.

Fig. 153.



Figs. 152 and 153 represent the same Pump, except the difference in the Brakes. Both Figs. are different from Fig. 151, in having the valves of gun metal, and with guides on the cylinder for piston rod. They make a very efficient and reliable Fire Engine, either stationary or portable, and are admirably adapted for this service in factories, mills, lumber yards, etc. They are also extensively used at railway watering stations, and for purposes of irrigation, tanneries, etc., and are especially valuable on board ship for washing decks, wetting sails, etc., or for fire protection. They can be worked by power as well as hand, the walking beam being rigged to attach power. We fit them with spring packing for hot liquids, when so ordered, and for attaching copper, lead or wrought iron pipes, as requested. We can vary the sizes of pipes to meet requirements, if any change is desired.

SIZES, CAPACITY AND PRICES.

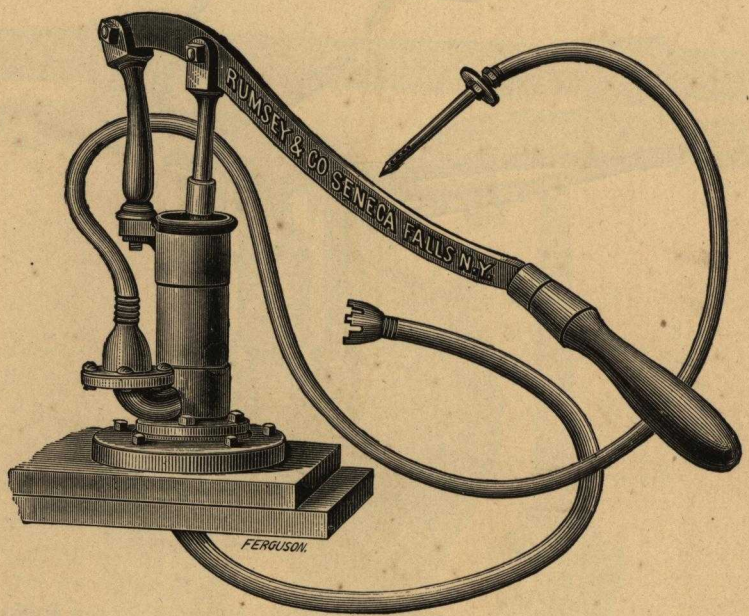
	Iron.	Copper Lin. Cyl.	Brass Cylinder.
No. 1, 3 inch cylinder, capacity per stroke 0.18 gallon, for 1½ inch pipe	$ 70 00	$77 00	$ 85 00
No. 2, 4 inch cylinder, capacity per stroke 0.35 gallon, for 2 inch pipe	80 00	88 00	100 00
No. 3, 5 inch cylinder, capacity per stroke 0.56 gallon, for 2½ inch pipe	95 00	113 00	120 00
No. 4, 6 inch cylinder, capacity per stroke 0.87 gallon, for 3 inch pipe	105 00	129 00	140 00

Rubber Buffers are placed on each side of Air Chamber.

BRASS HAM PRESERVING PUMP,

WITH NICKEL PLATED INJECTING NEEDLE, ETC.

Fig. 327.



This cut illustrates our New Brass Ham Curing Pump. It is neat, light, strong and of powerful operation. This is just the article for the purpose for which it was designed: *i. e.*, the injecting of preserving or pickling liquors into hams, shoulders, etc., under a great pressure, thereby effecting in a few moments what it usually requires days to perform by any other process. All parts with which the liquids come in contact are made of brass; the lever, rod and fulcrum are of wrought iron. The outfit includes Pump, 3 feet of $\frac{3}{4}$ inch suction hose, 5 feet $\frac{1}{2}$ inch discharge hose, with a nickel plated injecting needle and screwed nozzle, which can be removed for cleansing, etc.

While the curing of hams and other meats was the special design of this invention, it is equally well adapted for Embalming, etc. We can also highly recommend it for any purpose where a moderately strong hydraulic pressure is required, as in testing lead or iron pipes, beer casks, etc., it being made of ample strength to work up a pressure of from 200 to 400 pounds per square inch.

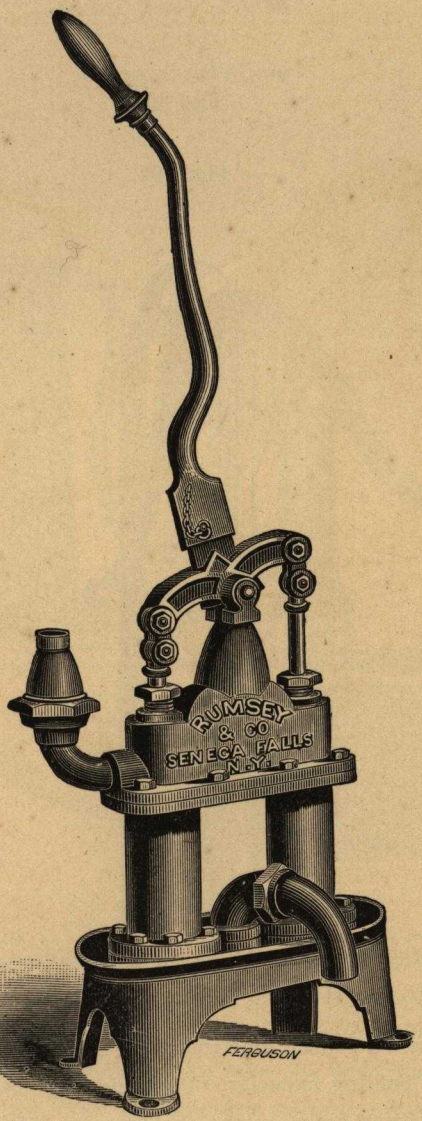
PRICE.

No. 1, complete, as shown in cut, with 2 inch brass cylinder, electro-plated needle and discharge pipe, hose, etc.	$25 00

BRASS DOUBLE CYLINDER FORCE PUMP,

FOR HOUSE OR SHIP USE.

Fig. 328.



The annexed cut represents our Two-Cylinder Ship and House Force Pump. It is durable and well arranged in all its parts, having an exceedingly perfect adaptation for its work. Among the many points that will commend it to the trade and practical Pump men, are the vertically working double pistons and nearly horizontal working lever, while it combines compactness with great capacity. The siphon form of suction elbow ensures the perfect working of the Pump at all times by keeping the lower valves constantly submerged. Brass plugs are provided at all necessary points for entirely emptying the Pump of water in cold weather. The discharge tube is brass, screwed inside for iron pipe, and with smooth outside for soldering on brass or copper pipe, and held in place by union nut coupling. The cylinders, rods, stuffing glands and air chamber are all brass. On the air chamber are rubber buffers to ease the concussion of the lever on its down stroke.

SIZE, CAPACITY AND PRICES.

No. 1, 2 inch cylinders, capacity per stroke 0.05 gallon, for 1 inch pipe	$25 00
No. 2, 2½ inch cylinders, capacity per stroke 0.07 gallon, for 1¼ inch pipe	35 00
No. 3, 3 inch cylinders, capacity per stroke 0.10 gallon, for 1½ inch pipe	60 00

BRASS AIR PUMP,

MOUNTED ON PLANK.

Fig. 167.

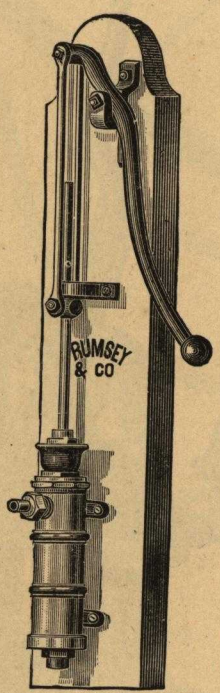


Fig. 167 shows our Brass Air Pump, constructed for forcing air or any gas into barrels, casks, or other receivers of small holding capacity, of any nature. It is handsome, convenient and perfectly made, being entirely of brass, except the lever and fulcrum. Many of its numerous uses can be greatly augmented by placing two Pumps upon the same Plank and lengthening the lever, thereby enabling two men to work it.

SIZES, CAPACITY AND PRICES.

No. 1, 2-inch Cylinder, capacity per stroke 18 cubic inches	$15 00
No. 2, two 2-inch Cylinders on one plank, capacity per stroke 36 cubic inches	35 00

Air Compressors and Vacuum Pumps of any size or capacity furnished on application.

IRON AIR PUMP.

Fig. 168.

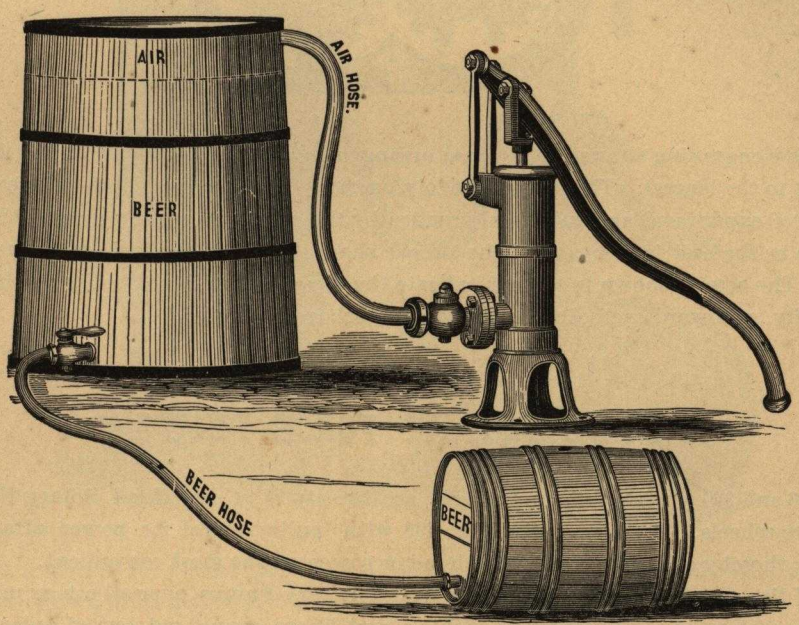


Fig. 168 is a cut designed to indicate one principal purpose of this Pump, but by no means entirely comprises its varied and general usefulness. It is extensively used in breweries for the purpose (shown in cut) of injecting air into the closed tanks, in order to maintain a pressure upon the surface of the beer, sufficient to force the liquor from the tank into barrels and other vessels placed upon a higher plane than the tank, although the engraving does not perfectly convey this idea. It has proved a decided success in all its uses. It is well constructed, very durable and easily repaired. When a pressure of more than four atmospheres is desired, the plunger should be covered with oil or water.

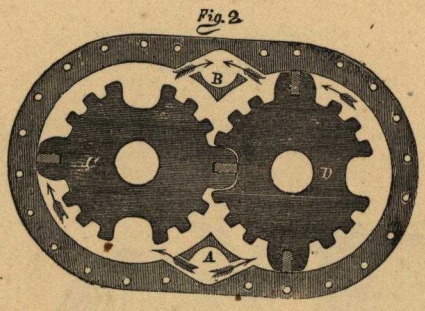
SIZE, CAPACITY AND PRICE.

No. 1, 4 inch cylinder, 62 cubic inches per stroke, for 1 inch hose.....	$20 00

ROTARY FORCE PUMPS.

SECTIONAL VIEW OF INTERIOR.

Fig. 293.



The above engraving shows the internal arrangement of all sizes of our Rotary Pumps, from the smallest to the largest. This form of revolving cams or pistons has been demonstrated, after many years of experiment and successful practice by the most prominent mechanics and manufacturers, to be the best in use, and of the proper shape to insure the very minimum of friction and wear. The arrows shown in the cut indicate the direction in which the Pump should be run, *i. e.*, inwardly, or toward each other at the top or discharging orifice.

HAND ROTARY FORCE PUMPS.

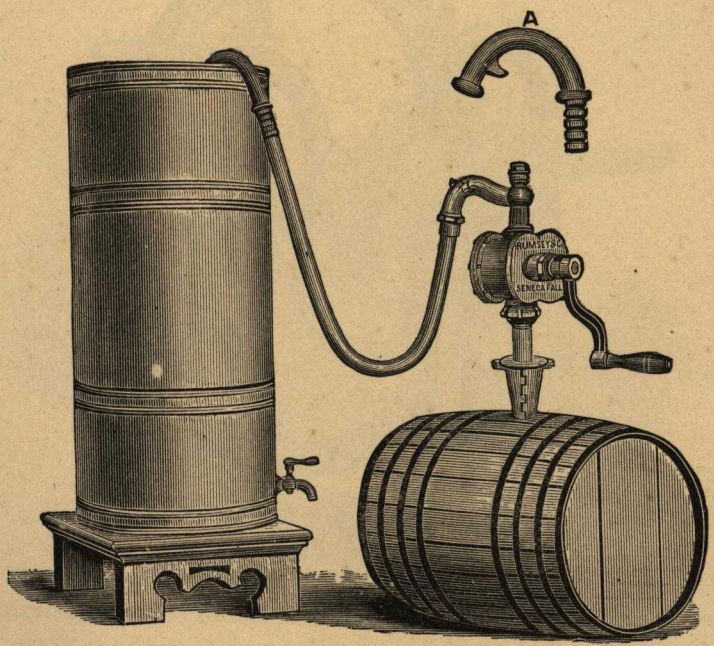
Figs. 196 and 320, on the following pages, are two styles of our Hand Rotary Force Pumps, with balance-wheels. We also build Fig. 196 with pulley-wheel for power attachment and hand crank, thereby adapting it either for hand or power use, as most convenient.

Some of the peculiar advantages of our Hand Rotary Pumps over all others may be briefly stated: The pistons or cams require no packing, and hence cannot get out of order. From the construction of the cams they operate with very little friction, and consequently the least degree of wear. Any intelligent mechanic will see the correctness of these assertions by referring to the principles of the invention as illustrated above, and will readily understand that it implies great durability and saving of power. By our application of the circular or rotary principle a uniform strain is brought to bear on all the working parts of the Pump, giving a smooth and easy operation, with an almost total absence of noise, jar and friction. They will *lift* water as far as any Piston Pump, and work against any pressure ranging from say 10 to 50 pounds, discharging a constant supply of water or other fluid to any height or point required, and by the attachment of hose will throw a steady stream from 75 to 100 feet from the nozzle with ease. Their compactness, durability and simplicity, and the small amount of labor necessary to work them, render these Pumps eminently fitted for use in hotels, manufactories, railway stations, oil refineries, etc., while their large capacity well adapts them, in convenience and utility, for pumping out mines, quarries and other places where there are considerable accumulations of water, and where it is not practicable to transmit machine power. They are also extensively used for testing pipes and hose, and, from their portable nature, are found very convenient by Gas Companies for testing their main pipes. A thread is cut on the spout for attaching hose, with which appliance they make a very effective garden or fire engine. We fit them for pumping hot or cold water, oil, spirits, or any acetous fluids. From the nature of the service required, breweries, distilleries, malt houses, etc., should always use bronze pumps.

HAND ROTARY PUMP,

WITH IMPROVED BARREL ATTACHMENT, OR HOLDER.

Fig. 196½.



This cut indicates in a clear manner one of the uses of our celebrated Hand Rotary Force Pumps. It is shown arranged with our improvement for holding the suction pipe of the Pump rigid in the bung of a barrel, and also exhibits the pieces which accompany each Pump. The holder is a conical sleeve in two halves, designed to clasp the pipe firmly in any sized bung from 1½ to 4 inches in diameter, and without injuring the shape of the bung in the least degree. The discharge pipe is so formed that it retains its hold on the tank without other fastening. A suction pipe three feet in length goes with each Pump, and is notched at the bottom so that the entire contents of the barrel can be discharged. With this complete and perfect apparatus liquids of any consistency can be pumped from barrels and other casks to any desired distance or height. It is a most useful appendage to all oil stores and refineries, drug houses, paint manufactories, etc. Our Rotary Pumps having two cams or pistons working into each other and two barrels or cases, operate easier and with less friction and produce a more useful effect than is obtained from any other form of cam. See opposite page.

SIZES, CAPACITY AND PRICES.

	Iron.	Bronze
No. 1, 1 inch suction, 1 inch discharge, for ⅞ inch hose, 10 gallons per minute	$17 00	$39 00
No. 2, 1 inch suction, 1 inch discharge, for 1 inch hose, 13 gallons per minnte	20 00	44 00

Above prices include suction pipe, hose coupling, hook and holder, discharge spout and bung attachment. Brass or copper suction pipes furnished at the extra cost of metal only.

HAND ROTARY FORCE PUMP,

WITH BALANCE WHEEL.

Fig. 196.

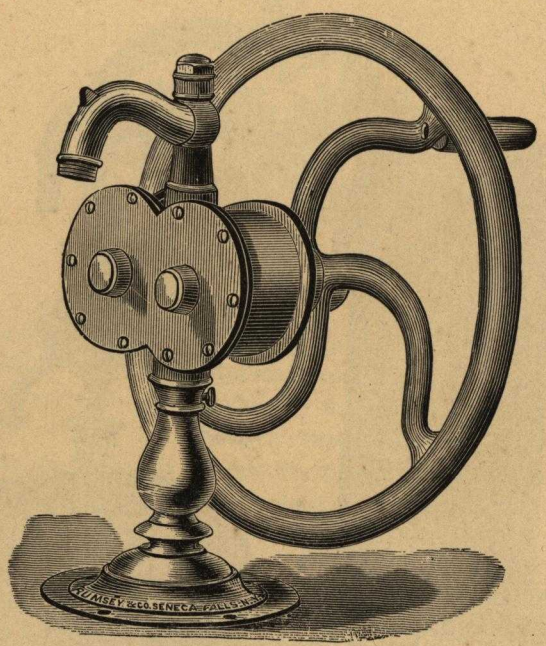


Fig. 196 represents all our medium sizes of Rotary Cistern Pumps. As a Lift or Force Pump, they are fully as effective for all purposes as any Piston Pump. They throw a large and constant stream with an easy and almost noiseless operation, and without the aid of an air chamber. They are made anti-freezing, being furnished with brass plugs for drawing off the water when not in use during cold weather. With only average care given them they are more durable than the ordinary Force Pump. The purposes and services of these Pumps are various and almost innumerable, being used extensively in cisterns and wells, pumping hot or cold liquids, filling boilers, as Tank Pumps for supplying tenders for threshing machines, in pumping wines, liquors and chemicals, testing pipes and hose, as a garden engine and for fire protection, for use in breweries, distilleries and oil refineries—in fact, they can be applied successfully to any and all uses for which a first class Force Pump is adaptable. The cams are of the most approved pattern, and fitted and ground accurately together with the care and skill acquired only by long experience in building this class of Pumps.

SIZES, CAPACITY AND PRICES.

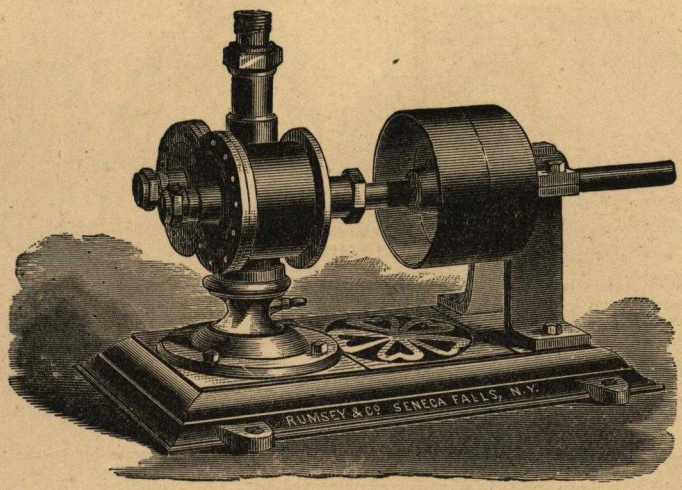
	Iron.	Bronze
No. 1, with balance wheel, capacity per revolution 0.08 gallon, for 1¼ inch pipe	$19 00	$40 00
No. 2, with balance wheel, capacity per revolution 0.10 gallon, for 1½ inch pipe	21 00	45 00
No. 4, with balance wheel, capacity per revolution 0.16 gallon, for 2 inch pipe	35 00	64 00
Hose and pipe suitable for Nos. 1 and 2, extra		3 00
Hose and pipe suitable for No. 4, extra		5 00

The spouts of all sizes of Fig. 196 are screwed for attaching hose. Hose and play pipes furnished, when ordered.

POWER OIL ROTARY FORCE PUMP,

MOUNTED ON IRON FRAME.

Fig. 197.



The above cut shows one of our celebrated Rotary Oil Power Pumps, without outside gearing, arranged with tight and loose pulleys, outside Babbitt bearing, etc. This is a cheap and very useful Pump, well adapted to establishments requiring but a small stream pumped, and want it rapid and constant. It is very compact and durable, and, in contrast to its size and price, will be found to possess a large capacity and ability to perform a great deal of hard work. It is well adapted for a small Fire Pump, and will throw water from 125 to 150 feet horizontally. For Oil Refineries, Breweries, Distilleries, etc., it is admirably suited for various purposes, and is also in extensive use in Cotton and Woolen Factories for pumping drinking water into upper rooms. These Pumps are constructed in the same perfect manner as those of a larger class, the only difference being the absence of the outside gearing. The driving shaft is made of ample length to permit a balance wheel with handle to be placed on outside of the bearing, readily enabling it to be worked by hand in an emergency. The spout is screwed for hose on the outer end, and for wrought iron pipe where it connects to the Pump. The spout can be removed and connection made with iron pipe whenever it is necessary to force the water upward to any height above the Pump. These Pumps can be run up to 200 revolutions per minute, without injury, although we recommend a lower rate of speed.

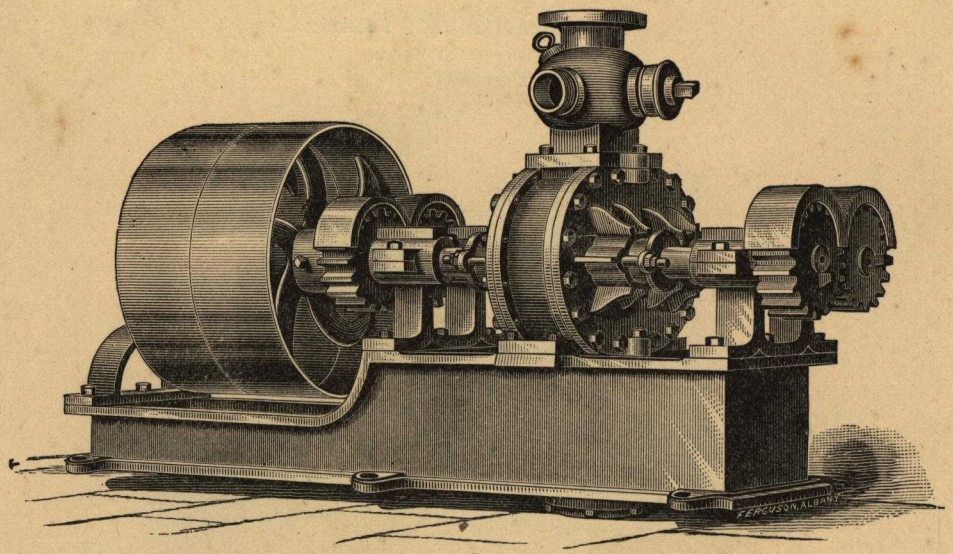
SIZES, CAPACITY AND PRICES.

With Tight and Loose Pulleys.	Iron.	Bronze.
No. 1, capacity per revolution 0.08 gallon, for 1¼ inch pipe	$26 00	$45 00
No. 2, capacity per revolution 0.10 gallon, for 1½ inch pipe	31 00	55 00
No. 4, capacity per revolution 0.16 gallon, for 2 inch pipe	48 00	75 00

Pulleys on Nos. 1 and 2 are 8 inches in diameter and 2½ inches face; on No. 4, 12 inches diameter and 3½ inches face. Balance Wheels for above Pumps, $1.00, $2.00 and $3.00, according to size.

ROTARY POWER FORCE PUMP.

Fig. 198.



This illustrates our well-known and unequaled Rotary Power Pump, Fig. 198. The cut shows it complete in all sizes, requiring no extra couplings and bearings, but in perfect readiness for bolting down. They are exceedingly strong, durable and compact in construction, with steel shafts running in white metal bearings of unusual length; are double-geared and furnished with either tight and loose pulleys, or gears, for driving, as most convenient for the purchaser. A capacious vacuum chamber, into which the suction pipe screws, is also cast in the frame. These valuable improvements, combined with others, render this Pump more easily set, stronger when set, reliable in critical emergencies, smoother in operation and more durable and efficient than any Rotary Pump in the market. In the many mills, distilleries and manufactories of every kind, where they are in such extensive use, they have invariably given the best satisfaction and results. We make them of bronze for breweries and other establishments where hot liquids, etc., render iron pumps objectionable on account of corrosion.

SIZES, CAPACITY AND PRICES.

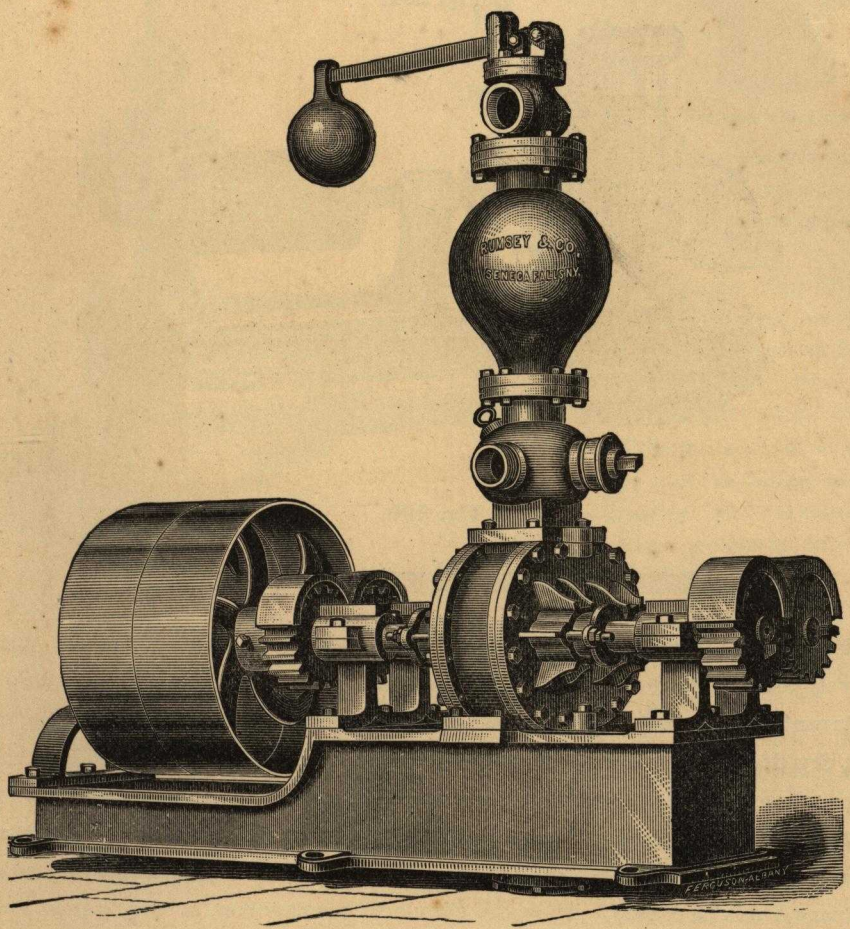
	Iron.	Bronze.
No. 1, capacity per revolution 0.16, 200 revolutions per minute, suction and discharge pipes 2 inch diameter, size of Pulleys 14x4½	100 00	$160 00
No. 2, capacity per revolution 0.42, 175 revolutions per minute, suction and discharge pipes 2½ inch diameter, size of Pulleys 16x5½	115 00	180 00
No. 3, capacity per revolution 0.62, 150 revolutions per minute, suction and discharge pipes 3 inch diameter, size of Pulleys 18x6½	160 00	260 00
No. 4, capacity per revolution 0.87, 125 revolutions per minute, suction and discharge pipes 4 inch diameter, size of Pulleys 20x8½	240 00	
No. 5, capacity per revolution 1.08, 100 revolutions per minute, suction and discharge pipes 5 inch diameter, Geared	300 00	
No. 6, capacity per revolution 2.66, 100 revolutions per minute, suction and discharge pipes 7 inch diameter, Geared	525 00	
No. 7, capacity per revolution 3.66, 90 revolutions per minute, suction and discharge pipes 10 inch diameter, Geared	650 00	

These Pumps can be run at a much higher speed, if necessary. After using, turn the cams backward two or three times to empty the Pump of water and prevent freezing, then pour in some good oil and turn the Cams forward two or three times. Any of our Power Rotary Pumps can be used for fire service.

ROTARY POWER FIRE PUMP,

WITH AIR CHAMBER AND SAFETY VALVE.

Fig. 199.



The above cut correctly represents one of our Rotary Fire Force Pumps, having air chamber and safety valve, and so arranged that one, two or three lines of hose can be attached for fire protection of mills, factories, warehouses, etc. They are perfect in operation and results. We furnish all necessary apparatus to conduct water from these Pumps to any required distance or height, with openings at different points for attaching hose. Hydrants, play-pipes, hose and couplings always kept in stock and supplied at lowest market rates.

Although pulleys are shown in cut, we advise the use of gearing, where practicable, as more reliable than belts in case of fire. Prices include safety valve and outside shaft.

SIZES AND PRICES.

No. 1, 14 x 4½ pulley, capacity per revolution 0.16 gallon, proper speed per minute 350 revolutions, 2 inch suction pipe, 1½ inch discharge hose, 1 stream	$110 00
No. 2, 16 x 5½ pulley, capacity per revolution 0.42 gallon, proper speed per minute 325 revolutions, 2½ inch suction pipe, 1½ or 2 inch discharge hose, 1 stream	125 00
No. 3, 18 x 6½ pulley, capacity per revolution 0.62 gallon, proper speed per minute 300 revolutions, 3 inch suction pipe, 2 inch discharge hose, 2 streams	175 00
No. 4, 20 x 8½ pulley, capacity per revolution 0.87 gallon, proper speed per minute 280 revolutions, 4 inch suction pipe, 2 or 2½ inch discharge hose, 2 streams	255 00
No. 5, geared pulley, capacity per revolution 1.08 gallon, proper speed per minute 200 revolutions, 5 inch suction pipe, 2½ inch discharge hose, 3 streams	315 00

HORIZONTAL CENTRIFUGAL PUMP.

Fig. 201.

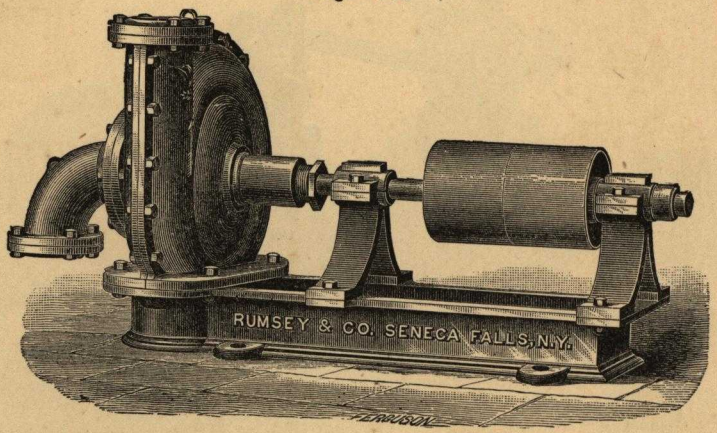


Fig. 200.

Figs. 201 and 202 illustrate the two styles of our celebrated Centrifugal Pumps. Although of comparatively recent introduction, they have attained the greatest popularity of any Pump of the kind invented, and are in extensive use in the principal tanneries, paper mills, breweries, distilleries, dry docks, coffer dams, steamships, etc., in the country, and by leading contractors in all works where water is to be raised in large quantities, containing coarse material, grit or sand. They are also unequaled as Wrecking Pumps, or for drainage and use in quarries, mines, etc., or in any situation or place where it is impossible to strain the water, as would be necessary in an ordinary valvular Pump. They are simple in construction, of easy action and almost impossible to get out of order, requiring little skill to set up and run them successfully. Each Pump is thoroughly tested before leaving our factory. All parts are of the best material and workmanship. They are set up on a neat and substantial iron frame; the bearings are of white metal, which never heats or cuts, if occasionally oiled. Comparatively little power is needed to produce an enormous quantity of work. Full instructions for setting up and running accompany each Pump. An arrow is cast upon the side to show the direction in which the disc or shaft should revolve.

We furnish extra shafting, couplings, etc., at a slight advance on cost of material and labor of fitting. Discharge pipes of copper, brass, iron or wood, furnished at lowest market rates, if ordered.

Fig. 200 shows suction pipe with our foot valve, which we furnish at extra charge. The foot valve should always be used with suction pipe on all Centrifugal Pumps, to retain the priming.

See Fig. 126, page 557, for sizes and prices of foot valve.

For prices, capacity, etc., of Pumps, see page 631.

VERTICAL CENTRIFUGAL PUMP.

Fig. 202.

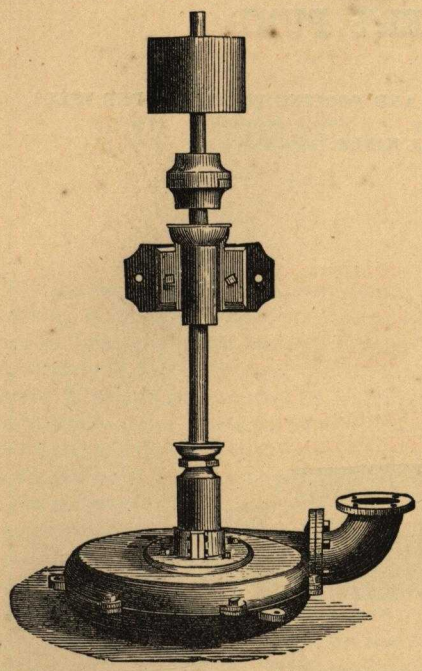
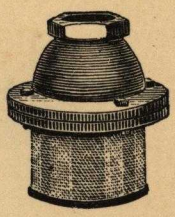


Fig. 203.

FOOT VALVE.

Fig. 126½.



Wrapped with Gauze.

Fig. 202 represents our Vertical Centrifugal Pump, adapted to all uses mentioned on opposite page, under Fig. 201.

We furnish Fig. 201 and Fig. 202, all complete, as shown in cuts, at prices named below. In ordering, state whether the Pump is to be right or left-handed.

This table gives sizes of pulleys and discharge pipes; also, capacity and revolutions per minute necessary to raise water to different heights.

SIZES, CAPACITY AND PRICES OF FIGS. 201 AND 202.

Numbers.	Size of Discharge Pipe, Inches.	Capacity per Minute, Gallons.	Diameter of Pulley, Inches.	Face of Pulley, Inches.	Revolutions per Minute.								Figure 201. Price.		Figure 202. Price.	
					6 feet.	8 feet.	10 feet.	12 feet.	15 feet.	20 feet.	25 feet.	30 feet.	Iron.	Brass.	Iron.	Brass.
2	1½	100	5	4	850	900	1,000	1,150	1,600	1,750	1,900	2,000	$ 30 00	$ 60 00	$ 24 00	$ 48 00
3	2	350	5	4	550	600	750	850	900	1,000	1,150	1,300	65 00	120 00	55 00	100 00
4	2½	500	6	5	450	500	550	650	800	900	1,000	1,100	75 00	145 00	65 00	130 00
5	3	700	6	5	400	450	500	550	650	750	850	1,000	90 00	160 00	70 00	160 00
6	4	1,000	7	7½	300	350	400	450	550	650	750	900	120 00	250 00	105 00	200 00
6½	5	1,800	9	8	275	325	375	425	525	650	750	850	140 00	325 00	130 00	305 00
7	6	2,500	10	8	250	300	350	400	500	650	750	850	180 00	400 00	150 00	350 00
8	7	3,000	10	9	250	300	350	400	500	550	650	750	250 00		200 00	
9	8	4,000	12	10	200	250	300	350	450	500	550	650	300 00		240 00	

SIZES AND PRICE OF FOOT VALVES, FIG. 126½.

IRON.

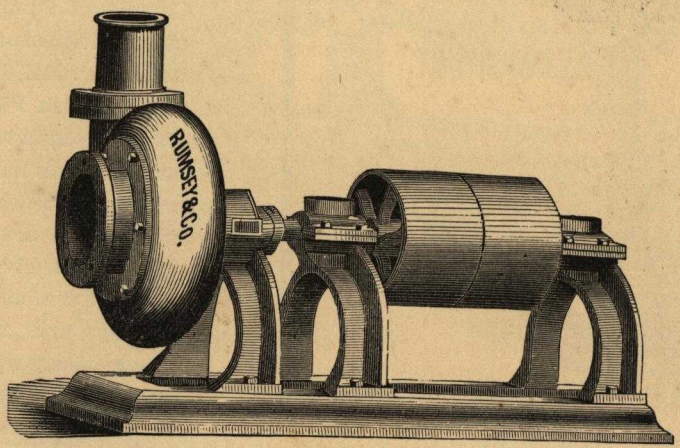
Fig. 126½, 1½ inch caliber Foot Valve	$ 2 50
Fig. 126½, 2 inch caliber Foot Valve	3 00
Fig. 126½, 2½ inch caliber Foot Valve	3 50
Fig. 126½, 3 inch caliber Foot Valve	4 50
Fig. 126½, 4 inch caliber Foot Valve	6 00
Fig. 126½, 5 inch caliber Foot Valve	8 00
Fig. 126½, 6 inch caliber Foot Valve	10 00
Fig. 126½, 7 inch caliber Foot Valve	12 00
Fig. 126½, 8 inch caliber Foot Valve	15 00

By increasing the speed above laid down, in any given instance, the Pump will discharge more water, or raise it higher. Fig. 203 represents Extra Shafting, which we furnish to order, at an extra price.

THE PAPER-MAKER'S PUMP.

FAN PUMP, ESPECIALLY ADAPTED FOR RAISING AND FORCING PULP IN PAPER MILLS, ALSO FLUIDS OF ALL KINDS.

Fig. 296.



We have recently made this Pump, more particularly to meet the wants of those in the paper manufacturing business, who desire a good and efficient Pump for forcing their pulp. We have, within the past few years, furnished large numbers of them to Paper Mills all over the United States, and we can assert that all inform us who bought them, that they are the best article of the kind they have ever used. We claim much for them on account of a new arrangement. The discharge pipe is so constructed as to revolve; thus it can be placed in any position at right angles with the frame upon which it rests and revolves. They are built with large capacity, of best materials, and are mounted on heavy iron frame, with tight and loose pulleys. We furnish them with pulleys, either 9 inch in diameter, 6 inch face—or 12 inch diameter, 5 inch face. These Pumps are simple, durable, will not clog, and perform to perfection all work for which they are designed.

SIZES, CAPACITY AND PRICES.

No. 3, 6 inch Suction, 4 inch Discharge, placed on strong Iron Frame, with tight and loose Pulleys.....	$ 78 00
No. 4, 8 inch Suction, 6 inch Discharge, placed on strong Iron Frame, with tight and loose Pulleys.....	125 00

If made of Brass, additional charge will be made at cost of material only.

THE HYDRAULIC RAM AND ITS PRINCIPLES.

The cut on following page represents one of our improved Hydraulic Rams, put up and in operation, furnishing water for house, cattle, etc. The fountain is shown at the right. From thence the water is taken through the drive pipe to the Ram, located in any convenient position not less than 25 to 50 feet from the fountain. This is necessary, as about this length of pipe is required to secure the velocity of water requisite to work the Ram properly. In cases where it is not practicable, the pipe may be bent in a coil 5 or 6 feet in diameter. From the ram the water is forced upwards through the discharge pipe, as shown, to the point of discharge. The Ram and pipe should be carefully secured against the effects of the frost.

The simple and effective operation of this machine, and its great durability withal, render it the most useful and valuable apparatus yet developed in the department of hydraulics for elevating water, and conveying it to almost any desired distance, depending, however, on the amount of fall at disposal.

It is practicable where the spring or brook is only 18 inches higher than the Ram; yet as the height increases, the more powerful the Ram operates, and its ability to force water to a greater elevation and distance is correspondingly strengthened. The relative height of the spring or source of supply above the Ram, and the elevation to which it is required to raise, determine the relative proportion between the water raised and wasted—the quantity raised varying according to the height it is conveyed with a given fall; also the distance the water has to be conducted, and consequent length of pipes, have some influence on the quantity delivered at the point of discharge, as the more extended the pipes through which the water has to be forced by the Ram, the more friction there is to be overcome by additional efforts on the part of the machine; notwithstanding Rams are frequently and successfully employed for driving water a distance of 100 to 200 rods to an altitude of 100 to 200 feet above the Ram, and severer trials than these even testify to the indispensability of this almost automatic device. A fall of 10 feet from the brook or spring to the Ram is abundantly sufficient to raise water to any point less than 150 feet above the location of the machine, while the same amount of fall will also raise water to a point considerably higher, though the supply of water will be proportionately diminished as the height and distance increases. When the requisite quantity of water is forthcoming from the Ram, operating under a certain fall, it is not judicious to give it more fall, for by so doing the strain on the machine is measurably augmented, those parts doing the labor are overtaxed, and the durability of the apparatus impaired and lessened.

For ordinary purposes it is sufficient to say that in conveying water say 50 or 60 rods, it may be safely calculated that from one-tenth to one-fourteenth of the water can be raised and discharged at an elevation ten times as high as the fall, or one-seventh part of the water can be raised and discharged, say five times as high as the fall applied, and so in like proportion as the fall or height is varied.

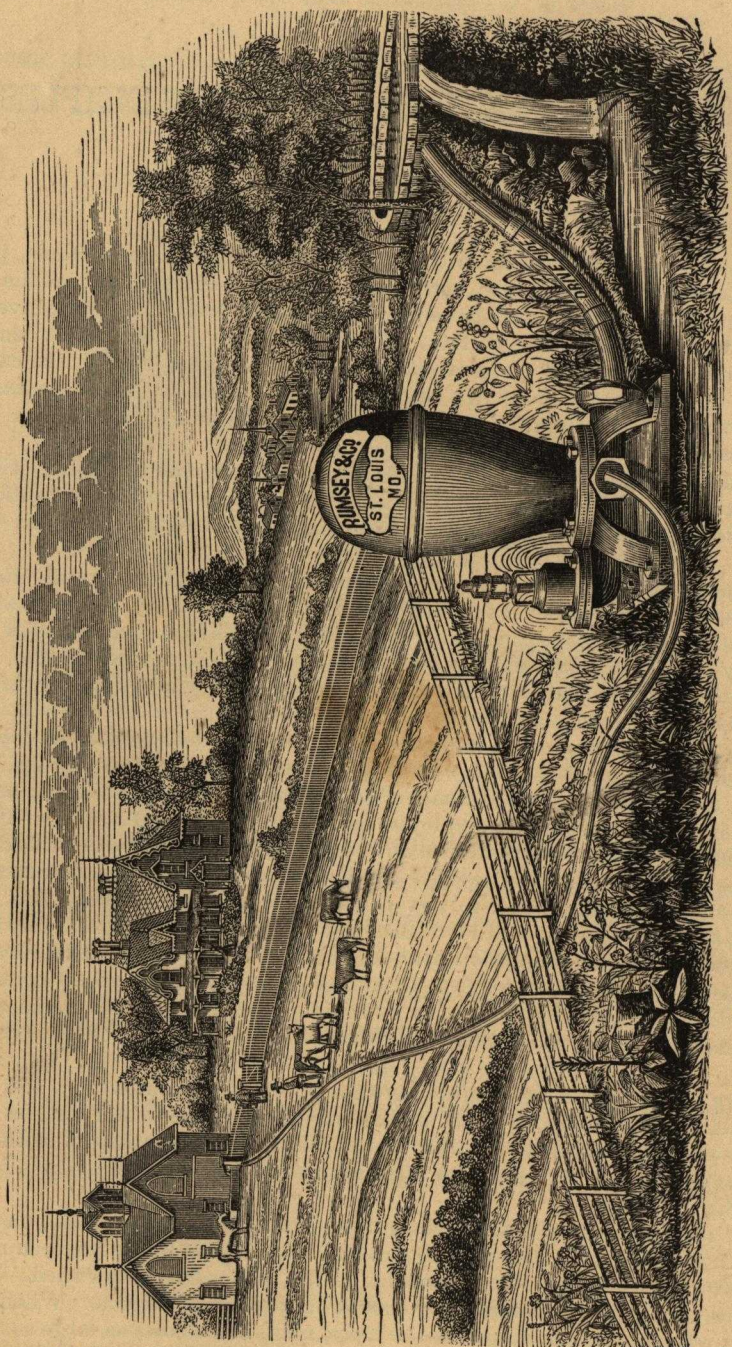
Thus, with a fall of 5 feet, of every seven gallons drawn from the fountain, one may be raised 25 feet, or half a gallon 50 feet. Or, with 10 feet fall, one gallon of every fourteen may be raised to the height of 100 feet, and so in like proportion as the fall or height is varied.

Turns in either drive or discharge pipe should be avoided, if possible. When it is impossible to set the Ram without having elbows in the pipes, make the elbows as large as may be, so as to place as little obstruction to the free and easy flow of the water as is practicable. These machines are made of iron and brass. The valve and valve stem are made of bronze, which has more durable and lasting qualities than any other composition.

See following pages for prices, capacity, tables, etc.

HYDRAULIC RAM IN OPERATION.

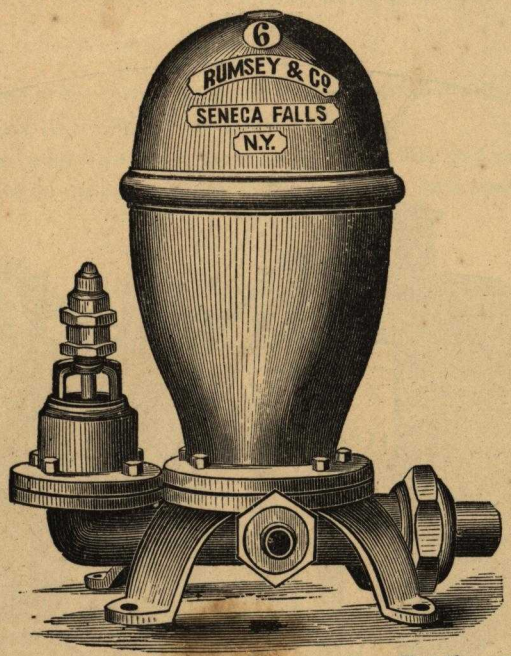
Fig. 206.



Where water is to be forced to any very great distance (say more than 75 rods), it is preferable to use a discharge pipe of larger caliber than named in the table on next page. With a given supply of water under a great fall, the Ram is not required to be of as large size as for the same quantity of water under a less fall. That is, our No. 4 Ram would be of sufficient capacity for taking water from a spring or brook, furnishing seven gallons per minute, where the fall was 8 or 10 feet; when if there was not over 3 or 4 feet fall to the same spring or brook, then a No. 5 Ram would be better adapted to the place. The Ram can be placed in a pit, and the pipes should be under ground, for protection against frost and other injury.

IMPROVED HYDRAULIC RAMS.

Fig 208.



The various uses of the Ram are at once obvious, viz: For the purpose of irrigating lands, supplying dwellings, gardens, factories, villages, engines, railroad stations, stock yards, etc., with running water.

The size of the pipes should vary in proportion to the distance the water is to be conveyed, as the greater the distance the larger the pipe in proportion to the size of the machine. This, however, applies to only the discharge pipe.

By means of an adjuster applied to each of our Rams, the quantity of water drawn from the fountain may be varied at pleasure—thus readily adapting the machine to a variable supply. The annexed table exhibits at a glance the capacity, size, price, etc. We furnish pipe, when ordered.

GENERAL RULE.—Multiply the quantity supplied by the spring (in gallons per minute) by 65. Multiply this product by the "Head," or number of feet in fall; then divide by 100 times the height to which the water is to be elevated. The result will give the quantity of water raised per minute.

Our Rams are fitted for either wrought iron pipe or lead pipe.

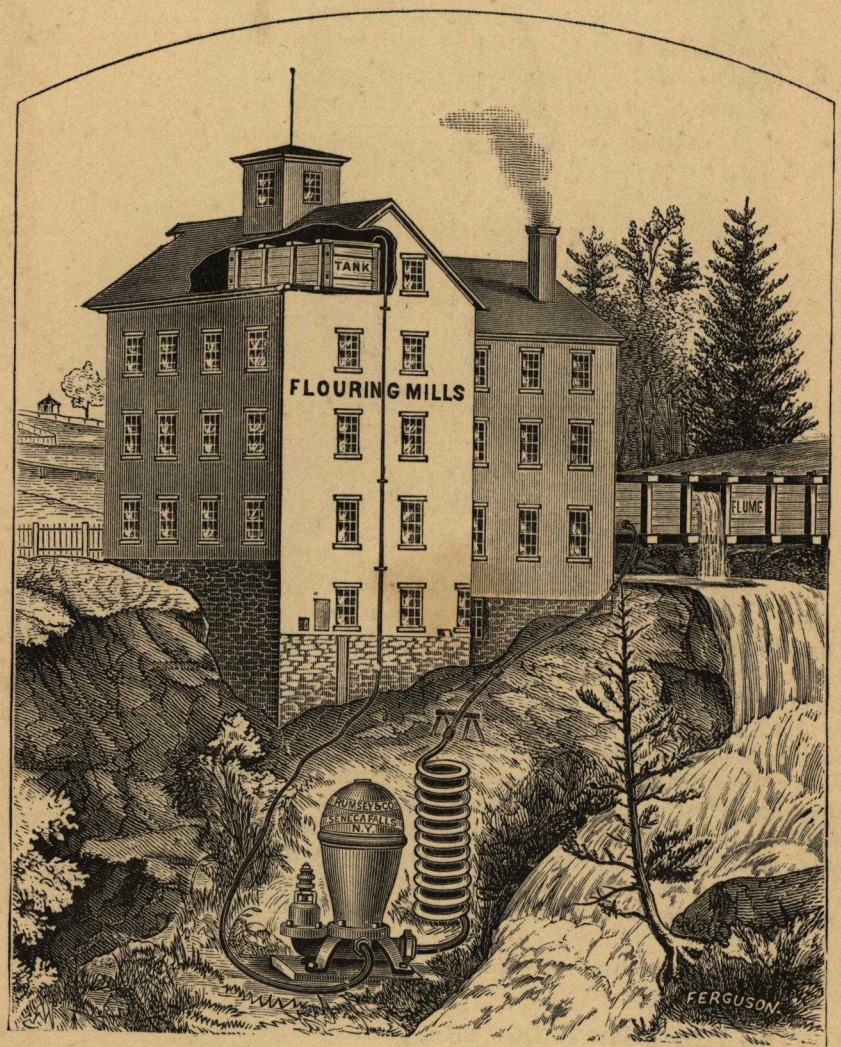
TABLE GIVING THE CAPACITY OF THE VARIOUS SIZES OF OUR RAMS, AND THE DIMENSIONS OF THE PIPES TO BE USED IN CONNECTION WITH THE SAME.

Size of Rams.	Quantity of Water Furnished per Minute by the Spring or Brook to which the Ram is adapted.	Length of Drive Pipe.	Caliber of Pipes.		Price.
			Drive.	Discharge.	
Number 2.	½ gallons to 2 gallons per minute.	25 to 40 feet.	¾ inch.	⅜ inch.	$ 9 00
Number 3.	1 gallon to 4 gallons per minute.	25 to 40 feet.	1 inch.	⅜ inch.	11 00
Number 4.	2 gallons to 8 gallons per minute.	25 to 40 feet.	1¼ inch.	½ inch.	14 00
Number 5.	3 gallons to 14 gallons per minute.	25 to 40 feet.	2 inch.	1 inch.	22 00
Number 6.	4 gallons to 25 gallons per minute.	30 to 40 feet.	2½ inch.	1¼ inch.	40 00
Number 7.	8 gallons to 60 gallons per minute.	30 to 40 feet.	4 inch.	2 inch.	75 00
Number 8.	12 gallons to 120 gallons per minute.	30 to 50 feet.	6 inch.	2½ inch.	125 00
Number 9.	80 gallons to 250 gallons per minute.	30 to 50 feet.	9 inch.	3½ inch.	225 00

HYDRAULIC RAM IN OPERATION,

WITH SPIRAL DRIVE PIPE.

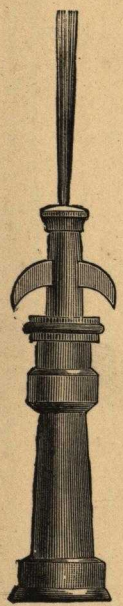
Fig. 346.



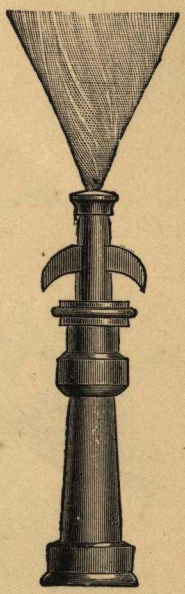
The above cut shows our novel and successful method of obtaining the requisite length of drive pipe, and utilizing the Hydraulic Ram in situations impracticable by any other mode. The principle of the application is fully shown; the Ram, however, can be placed directly under the flume instead of at a distance, as seen in engraving, and the drive pipe being of spiral form, can be wound either openly or closely, so that the usual length (50 feet) of pipe will occupy only the same space in height as the fall applied to the Ram. Any of the ordinary metallic pipes of the market can be used for this form of drive pipe at a slight advance in cost over straight pipe. For lead pipe, from its ductile nature, we advise the selection of an extra heavy grade, and that it be supported by a light framework of wood between the coils.

The nearer straight the drive pipe is the better the effect. Therefore, the diameter of the coil should be as large as circumstances will permit, in order to make as few turns as possible. The Ram, to be driven through a coil, is fitted for drive pipe one size larger than laid down in table on opposite page. No other deviation is needed from the ordinary form of Ram.

For prices, etc., of Ram, see opposite page.



NIAGARA COMPRESSION SPRAY HOSE PIPES.



SUPERIOR TO ANYTHING OF THE KIND EVER INVENTED.

(Patented February 8, 1881.)

It is far superior to the old style of Cock, or Ground Plug Nozzle, heretofore in use, for simplicity, durability and ease of operation.

It will not get wedged when thrown down, as the Ground Plug Cock will.

DIRECTIONS.—Turn the Tip or Nozzle to throw a spray, solid stream or shut off.

SIZE AND PRICE.

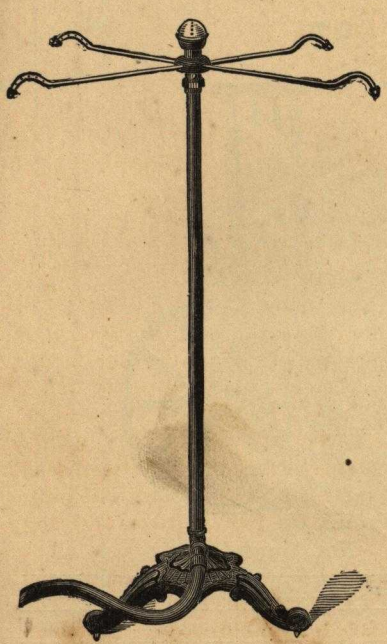
¾ inch Niagara Compression Spray Hose Pipe, per dozen.....	$9 00

IMPROVED LAWN SPRINKLERS.

PAINTED AND BRONZED.

The top jets revolve with the arms, adding greatly to the appearance when in operation. The revolving part is fastened with a screw inside and only one joint; this prevents the great leakage happening in the old style, and also allows the head to be taken off readily. The friction is greatly reduced, thus lessening the liability to wear and stick.

Four Arm, with Nickel-Plated Head.....	$6 50
Eight Arm, with Nickel-Plated Head.....	8 00



ACME LAWN SPRINKLER,

THE MOST EFFECTIVE AND SIMPLEST LAWN SPRINKLER MADE.

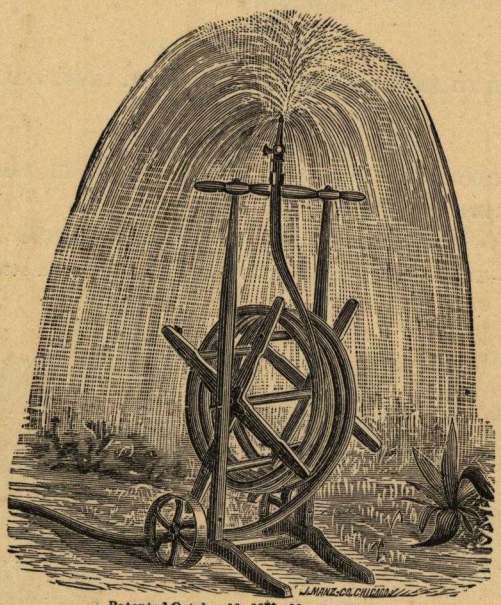
With the usual force of water furnished by water works it will sprinkle a space from 30 to 40 feet in diameter, possessing the great advantage of breaking the water into fine particles and distributing it evenly upon the surface it covers. It has no working parts to wear out, nor small perforations to stop up with any sediment that may be in the water. By a simple mechanical appliance the motion is given to the water instead of the sprinkler. It is portable, No. 1 weighing eight ounces.

Price, No. 1, per dozen.....	$15 00

For prices on Hose Nozzles, Hose Pipes, Hose Couplings, Hose Bands, Rubber Hose, see pages 74, 75, 77, 78, 264, 265 and 266.

NEW No. 1 FOUNTAIN HOSE CARRIAGE.

USE THEM AND PRESERVE YOUR HOSE.



Patented October 10, 1876—May 1, 1878.

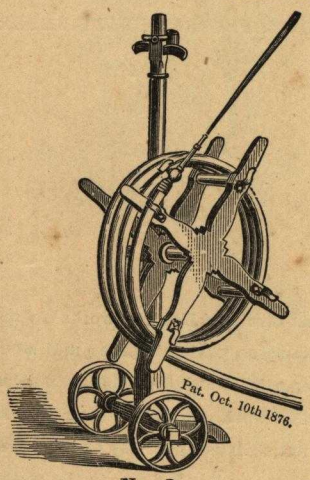
An important and distinctive feature in this carriage is the unusual diameter of the reel, which takes on the hose in coils so large that the water will pass freely through it, so that, instead of taking off all the hose every time it is used, it is only necessary to let off just sufficient to reach the point desired to sprinkle; when coiled up, a few turns of the reel will effectually expel the water from the hose.

In ordinary use, it is not necessary to remove the nozzle from the reel, or handle the hose, either when reeling off or on, or when in operation, as the reel can be fastened by a thumb screw, so as to poise the nozzle to the required angle, but it can readily be detached and placed in the clasp at the top of the standard and used as a fountain, if desired.

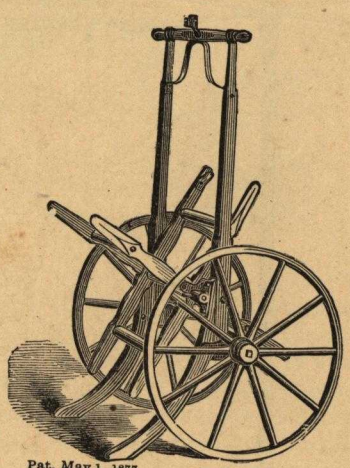
Although more especially adapted for use with the Magic Nozzle, its superior advantages as a reel and carriage, for handling hose with any nozzle, will be readily conceded. It will pay for itself in one season by preserving the hose, and is always ready for use. Use them and preserve your hose. Natural color of wood.

List Price, each	$3 00

THE FOUNTAIN HOSE CART.



No. 2.



Pat. May 1, 1877.

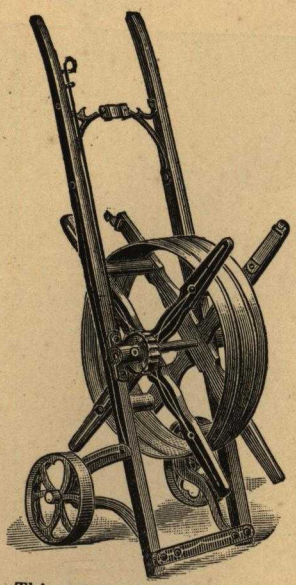
Nos. 3 and 4.

No. 2 takes 50 to 100 feet ¾ inch hose	$3 50
No. 3 takes 150 to 250 feet ¾ inch or 150 feet 1 inch hose	5 00
No. 4 takes 150 feet 1½ inch or 200 feet 1¼ inch rubber, or larger quantity or size of linen or cotton hose	9 00

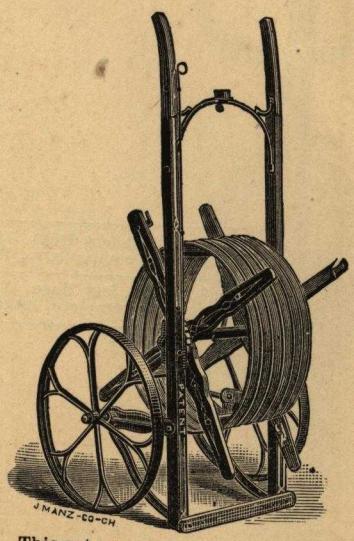
For prices of Rubber Hose, see pages 264, 265 and 266. For prices of Hose Pipes, Couplings, etc., see pages 74, 75, 77 and 78.

THE DRUM HOSE CART.

(Patented October 22, 1878.)



This cut represents Reel O.

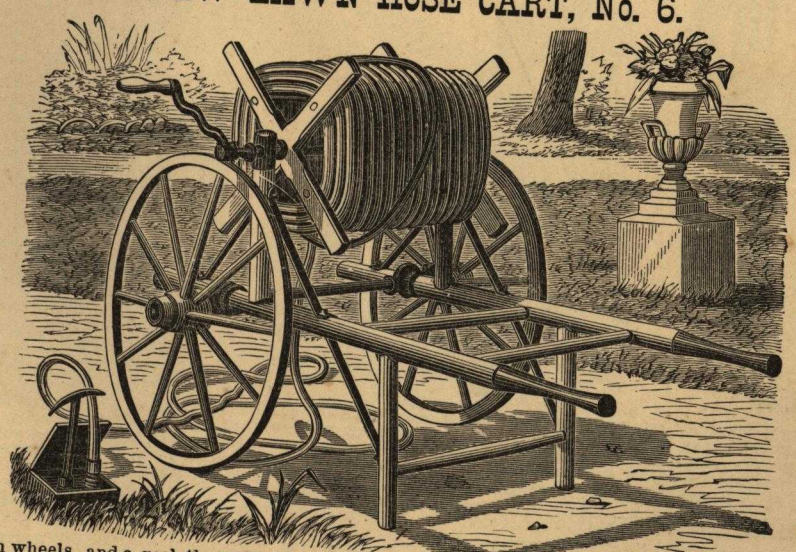


This cut represents Reels A and B.

Designed for handling yard hose in connection with yard hydrants, with several desirable features: 1. Its substantial construction, the side pieces forming the handle and step when in angular position. 2. A very ingenious device, secured to brace or hold nozzle in position for sprinkling purposes, or hydrant end of hose when not in use; also same device on reel arms for holding hose and nozzle. 3. A metallic hose-supporting rim to keep the hose in a true and circular position, preventing its breaking down, as it does when reeled across bars or arms, causing the hose, in a short time, to break and give out at those points. 4. The ratchet device for holding the hose in position as fast as reeled up, thereby preventing a very great annoyance by unwinding, as in other reels, if the operator stops to adjust the hose, by its getting misplaced or outside of reel arms, thereby preventing its slacking up, and holding it in any position, at will of operator. 5. The Drum Hose Cart is mounted on strong iron wheels; it is nicely balanced, so that, when loaded, there is no draft or extra weight bearing down on operator; all points of tipping over have been guarded against. After using the reel, by reversing, it will expel all water, thereby saving all the laborious and unpleasant work of emptying water from the hose, as heretofore.

Reel "OO" takes 50 feet 1 inch, or 75 feet ¾ inch hose, without drum	$4 00
Reel "O" takes 50 feet 1 inch, or 75 feet ¾ inch hose, with drum	5 00
Reel "A" takes 100 feet 1 inch, or 150 feet ¾ inch hose, with drum	6 00
Reel "B" takes 150 feet 1 inch, or 250 feet ¾ inch hose, with drum	7 00

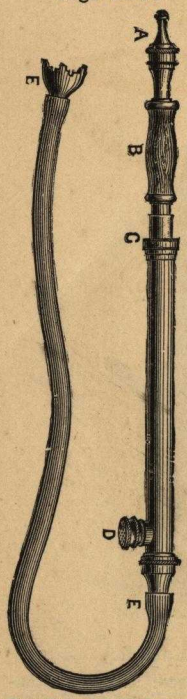
NEW LAWN HOSE CART, No. 6.



It has 30 inch wheels, and a reel that will take up 200 feet of 1 inch hose. It is a great convenience, and a great saving of hose and wearing apparel.

Price, each	$10 00

Fig. 297.



THE HYDRONETTE, OR FIRE EXTINGUISHER.

No. 2, with 3 feet Hose, Nozzle and Sprinkler, complete, medium size..	$ 8 00
No. 3, with 3 feet Hose, Nozzle and Sprinkler, complete, large size.....	10 00

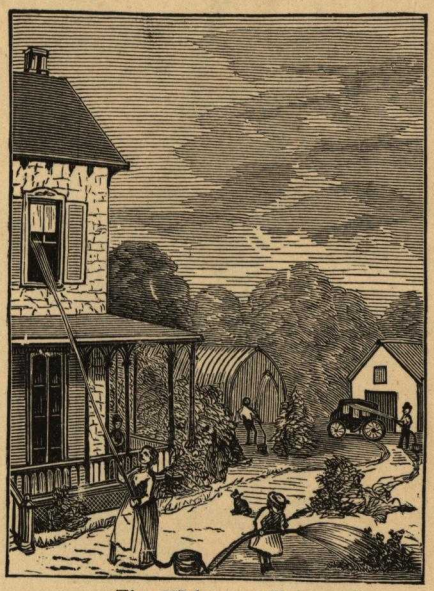


Fig. 297 in operation.

L. M. RUMSEY MFG. CO.'S SYRINGES AND FIRE EXTINGUISHERS.

Fig. 268.

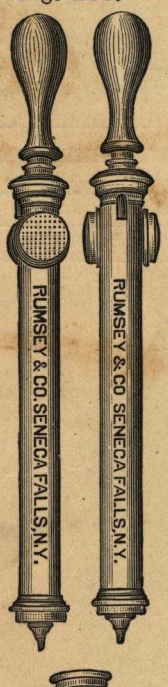


Fig. 269.

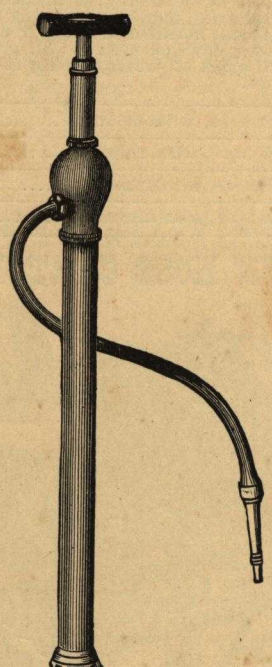
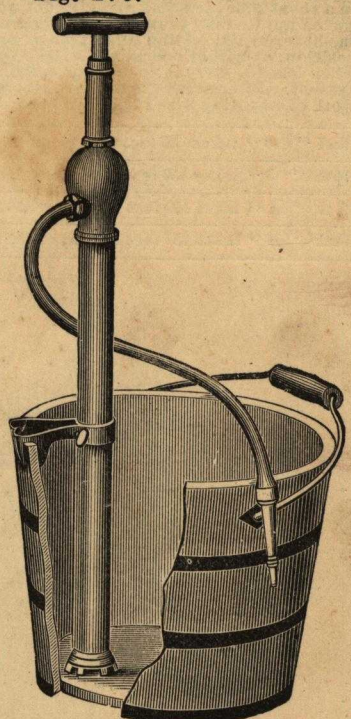


Fig. 270.



The above cuts represent our well-known Syringes and Fire Extinguishers, valuable for watering lawns, gardens and greenhouses, or washing windows, etc. They are conveniently adapted for sprinkling liquid solutions of any kind on trees and plants to destroy insects, etc., or will throw a strong jet of water and subdue a fire in a chimney or on a roof, where no other protection is available. They are made of brass; are handsome, durable and efficient, and do not corrode or rust.

BRASS SYRINGES.

Fig. 268, No. 1, Medium Size, 12 inch barrel.....	$5 00
" No. 2, " " 16 " "	6 00
" No. 3, Large Size, 16 " "	8 00
" No. 4, " " 18 " "	9 00

FIRE EXTINGUISHERS.

Fig. 269, No. 1, Medium Size, 20 inch barrel.....	$7 00
" No. 2, Large Size, 24 " "	8 00
Fig. 270, No. 1, with Pail, Med. Size, 20 in. barrrel	8 00
" No. 2, " " " 24 "	9 00

Prices of Figs. 269 and 270 include three feet of Hose, Brass Discharge Pipe and Sprinkler.

PATENT AQUAJECT, OR FIRE ANNIHILATOR.

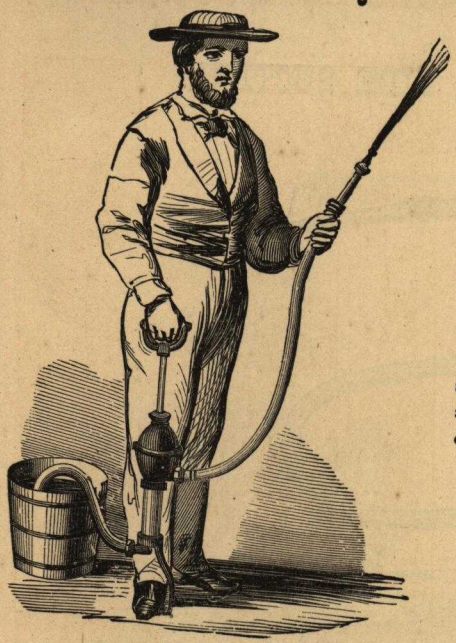
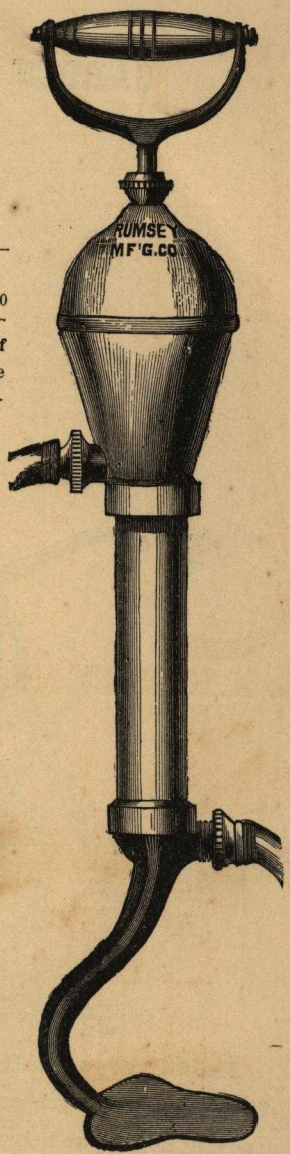


Fig. 276.



PRICE.

With 2½ feet suction, and 3 ft. discharge hose, with brass discharge pipe and sprinkler	$9 00

We can furnish extra lengths of suction and discharge hose for the above, at reasonable rates, when requested.

Is the latest novelty of its kind in the market, and for practical advantages and other merits surpasses anything ever offered in this line. It is designed for sprinkling lawns and roads, for washing windows and carriages, for extinguishing fires, and for any purpose where a force sufficient to carry thirty or forty feet is an object. It is also strongly recommended for throwing liquid poison to destroy worms on cotton and tobacco plants, fruit trees, shrubbery, etc.

The Pump is double-acting, and, while working, is placed on the ground and held steady by one foot of the operator resting on it, and supplies itself by means of a hose (3½ feet long) attached to it, from a bucket, barrel, etc., and delivers the stream through a nozzle attached to another piece of hose (3 feet long). A rose sprinkler is furnished to screw on the nozzle. The construction is exceedingly simple and durable; all iron is galvanized to keep it from rusting; instead of cylinders and pistons, two rubber diaphragms are used, and rubber balls perform the function of valves. The operation of working being a forward and backward motion of the handle, is far easier than the forcing up and down of a piston in a cylinder pump, and, in fact, so easy that a child can work it without tiring. We can fully recommend it.

Price, each	$9 00

GARDEN OR FIRE ENGINE, SIDE SUCTION.

Fig. 241.

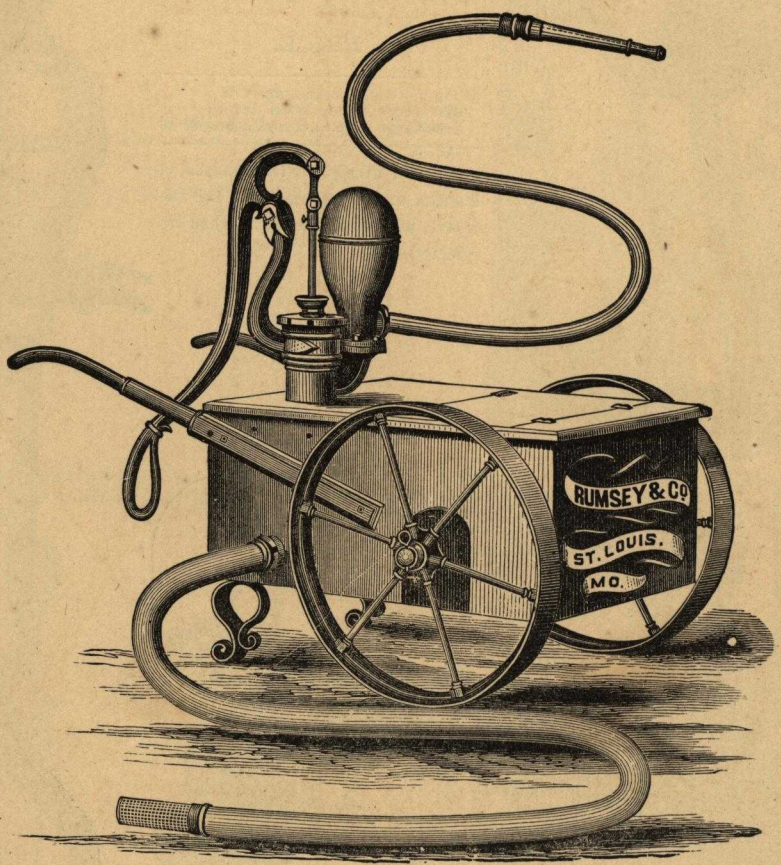


Fig. 241 shows our Improved Garden or Fire Engine, which, for capacity, convenience and utility, cannot be surpassed. The box holds about a barrel of water. It throws a strong and steady stream to the height of 60 feet, and can easily be wheeled from place to place and operated by one man. It is also arranged with Suction Hose to draw from cistern or well, giving, practically, an unlimited water supply in case of fire, while unexcelled by any apparatus for nurserymen, or for watering gardens, washing windows, etc. With our new "Diffuser," it is a superb article for laying dust, or sprinkling trees and plants with liquid compositions to destroy insects, worms, etc. Being light and compact, it is very convenient on board vessels for wetting sails, washing decks and fire protection.

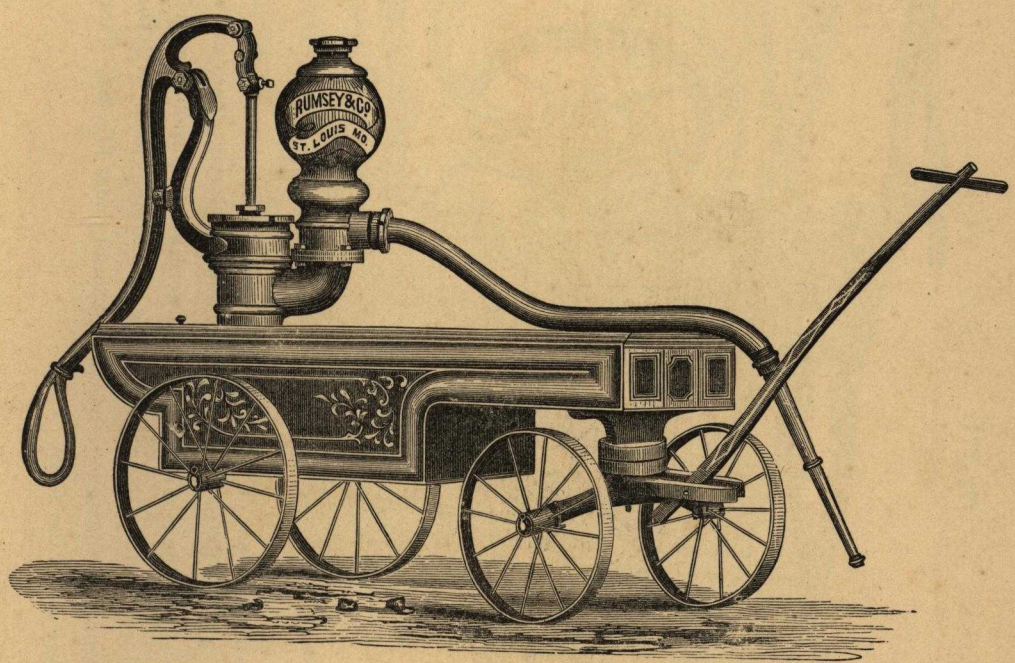
SIZES AND PRICES.

No. 1, Medium Size, Wood Handles	$25 00
No. 2, Extra Large, Wood Handles	40 00
Fitted for Suction Hose, extra	3 00

Above prices include three feet Leading Hose, with Brass Discharge Pipe and Sprinkler, or "Diffuser." Suction Hose extra, and not furnished unless especially ordered.

PROTECTION FIRE ENGINE.

Fig. 242.



The cut illustrates a small Fire Engine with a water reservoir of a capacity of about two barrels. The running gear is made of wrought iron, and is tasteful, light and strong. One man can transport it from place to place, and with ease throw a $\frac{3}{8}$ inch stream 80 feet horizontally, or 60 feet vertically. It is arranged for taking water either from the box, or by attaching suction hose to the coupling at the end of the box for this purpose. A supply can be drafted from wells or reservoirs from 15 to 25 feet deep. Four feet of hose and brass discharge pipe accompany each machine, as shown in cut. We can furnish suction hose to order at manufacturers' lowest prices.

PRICE.

Fig. 242, Protection Engine, complete, as shown in cut	$75 00

SWAN NECK VILLAGE FIRE ENGINE,

WITH FOLDING BRAKES, GUN METAL CYLINDERS, ETC.

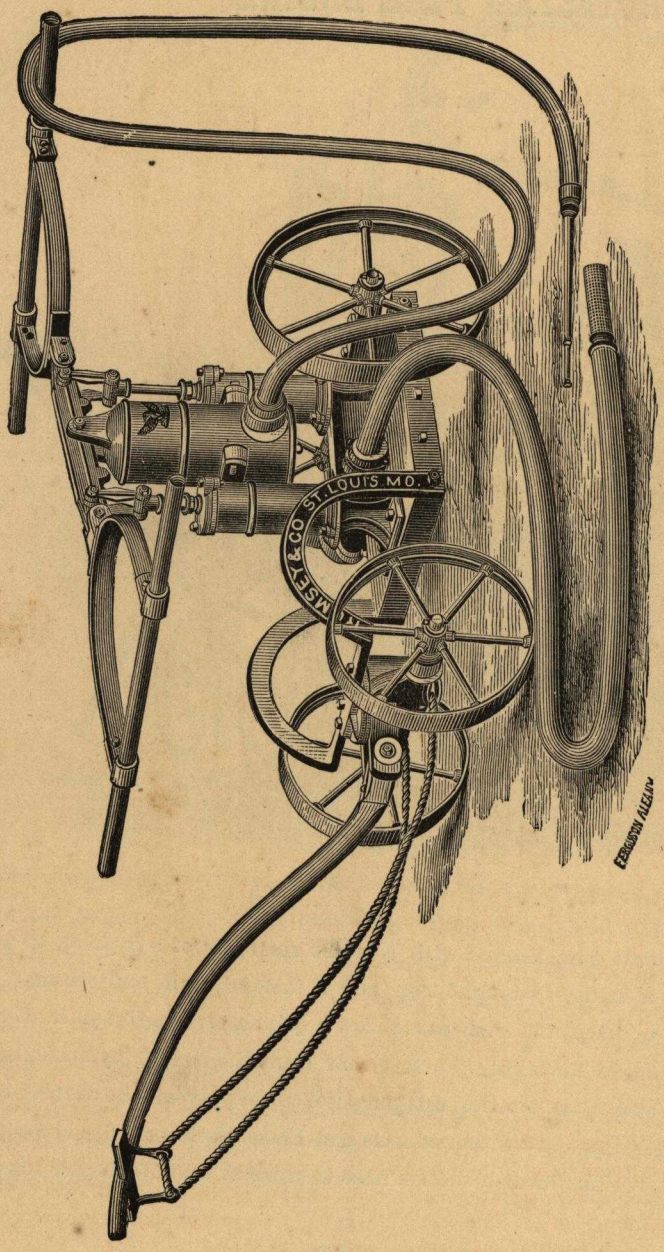


Fig. 271.

The cut gives an idea of the form and style of these beautiful machines, but not of the tasteful manner in which we finish and decorate them. All the brass work is polished and burnished. They are very powerful and durable. The axles are wrought iron and of the best quality; the platform strongly ironed, with fifth wheel underneath it; the tongue of seasoned hard wood. Room on brakes for from two to eight men. Will throw from 75 to 100 feet. With each machine we send same hose and accoutrements mentioned under Fig. 324. Pump is same in both Figs., being strong, with large capacity and water ways.

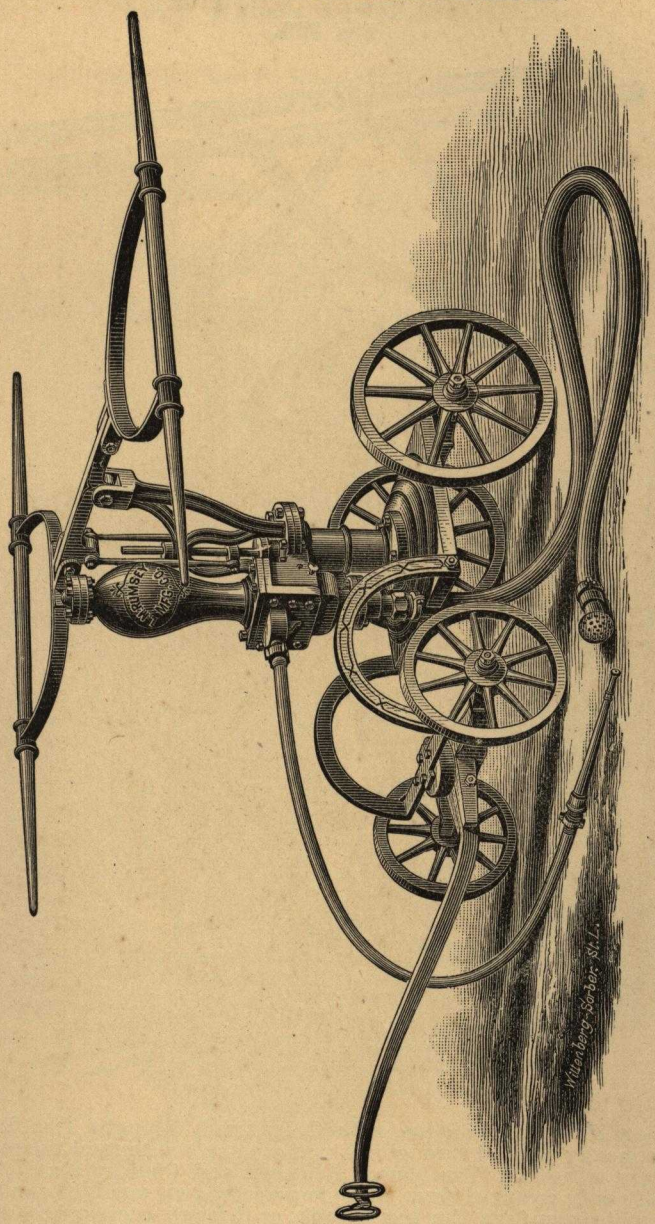
SIZES, CAPACITY AND PRICES.

	Iron.	Gun Metal Cylinders.
No. 1, 4 in. cylinders, capacity per stroke 0.35 gallon, for 2 in. suction and 1½ in. dis. hose.....	$170 00	$200 00
No. 2, 6 in. cylinders, capacity per stroke 0.87 gallon, for 3 in. suction and 2 in. dis. hose.....	210 00	275 00

Prices do not embrace Suction Hose, which we furnish when ordered.

No. 26, PACIFIC FIRE PUMP,

WITH FOLDING BRAKES, MOUNTED ON TRUCKS.



The above cut represents our Number 26 Pacific Pump, with 4 inch cylinder, 8 inch stroke, with Folding Brakes, mounted on Swan Neck Trucks, for fire protection. This makes a very powerful and durable Fire Engine. The axles are wrought iron of best quality, the platform strongly ironed, with fifth wheel underneath it, wood wheels with patent iron hubs, the tongue of seasoned hard wood. Room on brakes for from two to eight men, and will throw a stream of water from 75 to 100 feet. For description of this Pump, see page 612.

PRICE LIST.

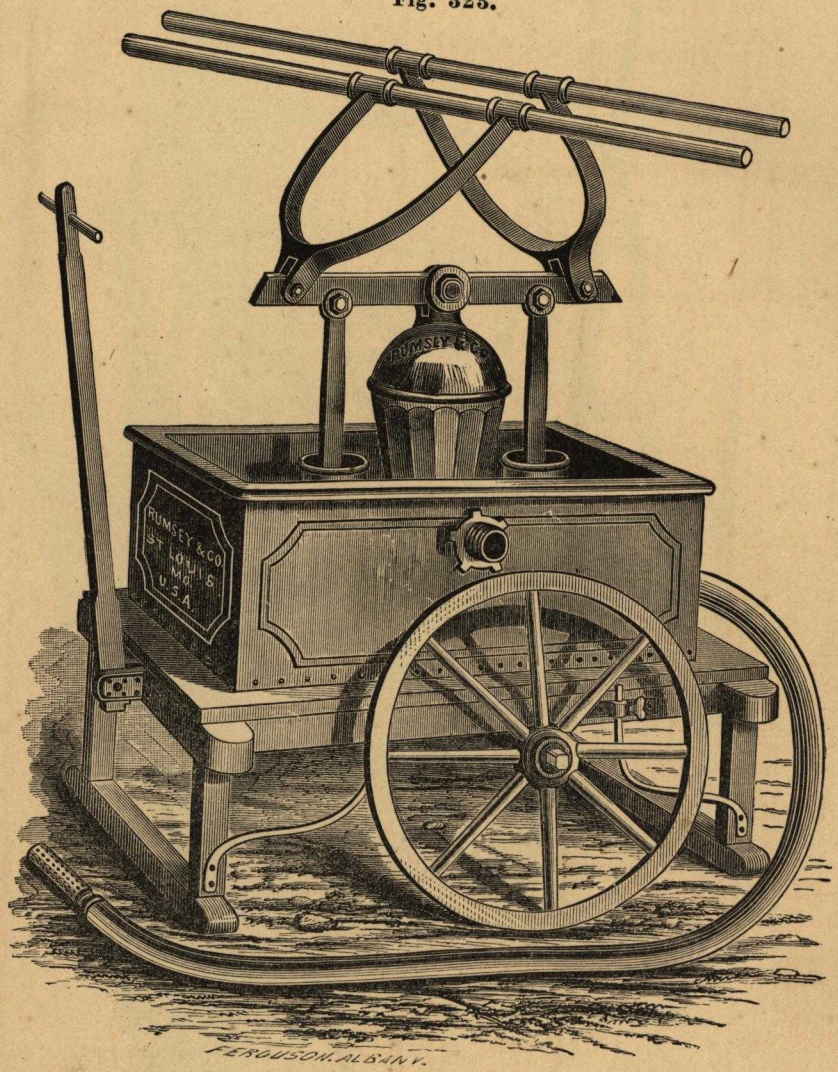
No. 26, 4 inch cylinder by 8 inch stroke, Pacific Pump, with Folding Brakes on Swan Neck Truck for 2 inch Suction and 1½ inch Discharge Hose, without Suction and Discharge Hose.....	$175 00

We do not furnish Suction or Discharge Hose at above prices. For prices of Suction and Discharge Hose, see pages 264 and 265.

"UNIVERSAL" HAND FIRE ENGINE,

WITH SIDE FOLDING BRAKES, ETC.

Fig. 323.



This shows our Hand Fire Engine, with Galvanized Wrought Iron Tank, on a strongly bolted wood frame, neatly painted throughout, and constructed to meet the requirements of small Towns and Villages, or around Warehouses, Factories and Country Seats. It is comparatively light, portable and easily removed from place to place by two men. It can be operated by from two to six men; will draw from the box or tank, or through suction hose from well or cistern. The wheels are 24 inches diameter, with 1½ inch tread, iron bound, and of the very best seasoned wood. The knees are arranged to fold up while being moved, and hold the machine firmly on the ground when in operation. The brakes can be folded as shown in cut, the whole arrangement occupying only 3x3 feet when the tongue is disconnected. From its compactness and power it would also be valuable on shipboard for fire protection, washing decks, wetting sails, etc. The tank has a capacity of 45 gallons.

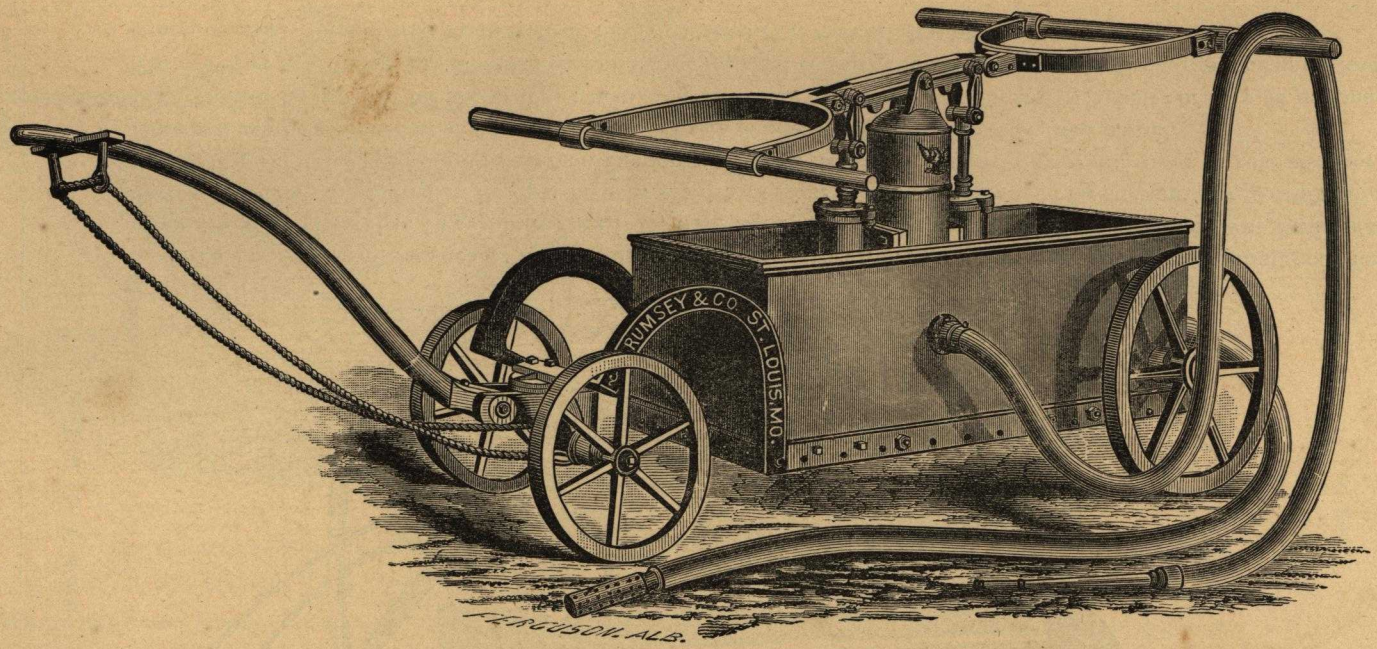
SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cyl.
No. 1, 3 inch cylinders, capacity per stroke, 0.09 gallons, for 1½ and 1 inch hose.....	$ 90 00	$100 00
No. 2, 4 inch cylinders, capacity per stroke, 0.16 gallons, for 2 and 1½ inch hose.....	100 00	120 00
No. 3, 5 inch cylinders, capacity per stroke, 0.28 gallons, for 2 and 2 inch hose..... ...	120 00	145 00

SWAN NECK FIRE ENGINE,

WITH FOLDING BRAKES, GALVANIZED IRON TANK, Etc.

Fig. 324.



This shows our Swan Neck, Iron Tank Village Fire Engine, with suction and discharge hose attached, ready for duty. It is arranged so the suction can be closed and water drawn from the tank, when filled from buckets. The Pump is the same shown in Figs. 280 and 271. Wheels 24 and 30 inches in diameter. Room on the brakes for eight men. The tank is of galvanized wrought iron, handsomely painted and holds 50 gallons. Will throw from 75 to 100 feet, or over any good sized house. We furnish with each machine 10 feet 1½ inch discharge hose, brass discharge pipe, and one each of ½ inch and ¾ inch nozzles.

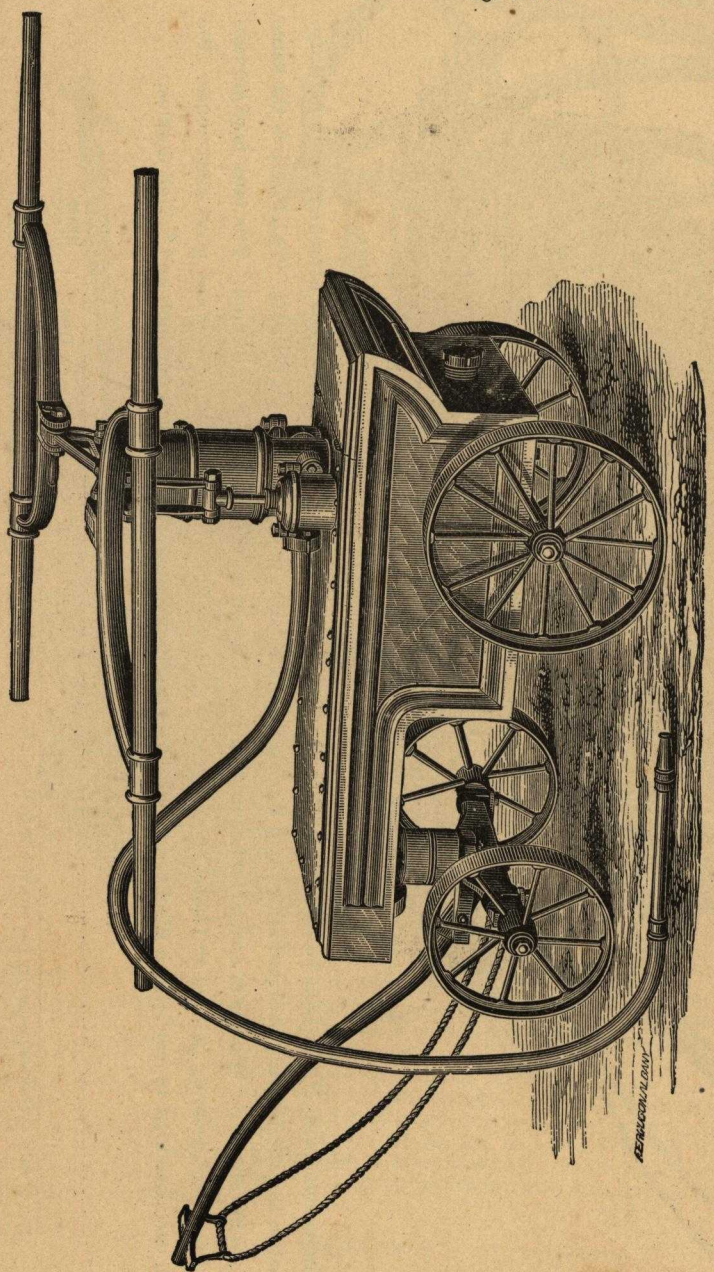
SIZES, CAPACITY AND PRICES.

	Iron.	Brass Cylinder.
No 1, 4 in. cylinders, capacity per stroke 0.35 gallon, for 2 in. suction and 1½ in. dis. hose.....	$200 00	$230 00
No. 2, 6 in. cylinders, capacity per stroke 0.87 gallon, for 3 in. suction and 2 in. dis. hose.....	250 00	315 00

NEW VILLAGE OR FACTORY FIRE ENGINE,

WITH SIDE FOLDING BRAKES, ARRANGED FOR SUCTION HOSE.

Fig. 280.



This is a powerful, capacious and handsome Engine, with strong running gear, and rigged throughout for prompt and good service. The brakes are iron, with hard wood levers, and fold, so the machine will traverse a narrow passage. Will turn in its own length. It draws from box, and is arranged for suction hose to draft from well or cistern. Has vacuum chamber on suction valves. Fitted with plugs to draw off water in cold weather. Hose reel can be attached at small extra cost. Wheels 18 and 24 inches in diameter, iron bound.

Brakes have room for six or eight men, and two men will do effective work. Capacity of Box 66 gallons. Throws from 60 to 75 feet high. With each machine we send 10 feet of leading hose, brass discharge pipe and ½ and ⅝ inch nozzles. Suction and extra leading hose furnished at lowest market price.

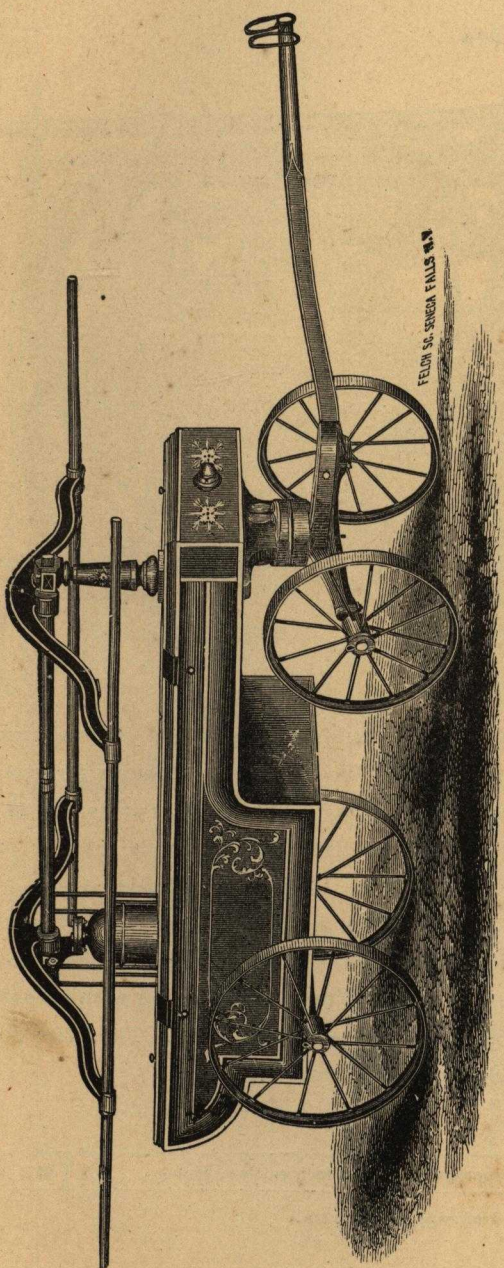
SIZE AND PRICE.

	Iron.	Brass Cyls.
Fig. 280, 4 inch Cylinders, suited for Discharge Hose 1½ in. caliber, and 2 in. Suction Hose.....	$150 00	$200 00

VILLAGE PROTECTION FIRE ENGINE,

ARRANGED FOR SUCTION HOSE. ROOM ON THE BRAKES FOR TWELVE MEN.

Fig. 244.



The Engine above shown is similar to Fig. 243, but has larger capacity of Cylinder and will accommodate more men on the brakes. It is light, but powerful, easily operated, and can be used to great advantage in villages and small towns. The brass cylinders have 4½ inches caliber and 7 inches stroke. Brakes have room for twelve men, although two men can work them and do good service. In other dimensions and construction it is like Fig. 243, with the usual fifth wheel underneath, so that it can be turned in its own length. These Engines are thoroughly built, of approved design, and perfectly reliable in all parts. Will throw 110 feet. They draw from box, and are also fitted for suction from other sources of supply. We send with each machine 10 feet 1½ inch discharge hose, 1 each of ⅝ and ¾ inch nozzles, brass discharge pipe, etc. Suction hose sent, when ordered.

SIZE AND PRICE.

Fig. 244, 4½ inch Brass Cylinders, suitable for 2½ inch Suction and 1½ inch Discharge Hose, each, net.....	$300 00

VILLAGE FIRE ENGINE,

WITH FOLDING BRAKES, FITTED FOR ATTACHING SUCTION HOSE. ROOM ON THE BRAKES FOR 12 OR 14 MEN.

Fig. 245.

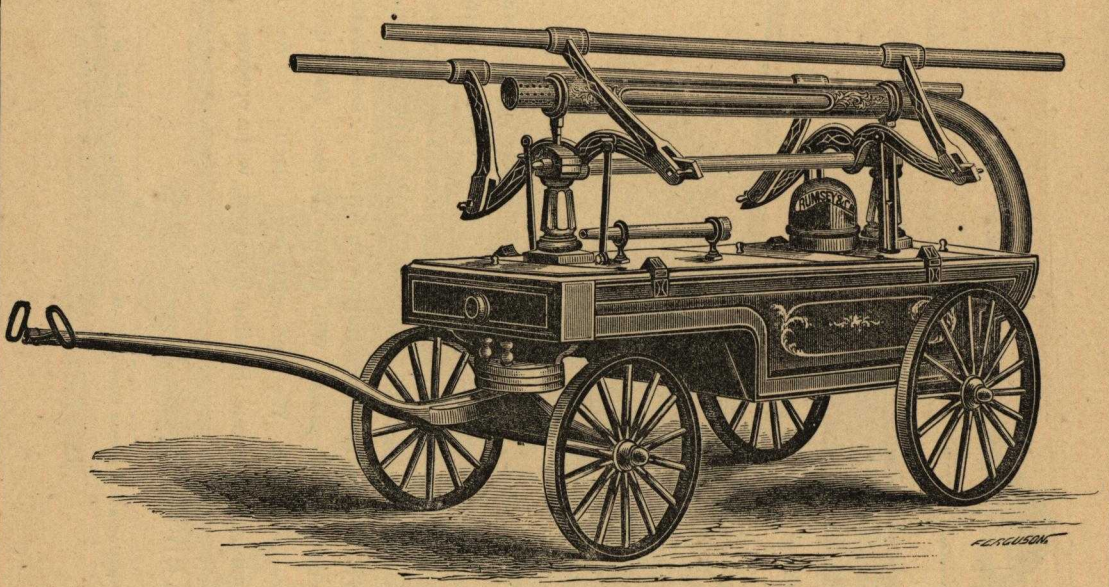


Fig. 245 represents our Village Fire Engine, arranged with side folding brakes. It is a strong, handsome and cheap Engine for villages, small towns, etc. We have also sold many for export to tropical countries, as the valves, being metallic, are not affected by the dryness or dampness of any climate. It is tastefully painted, and we letter it as desired, without extra charge. We build it with brass cylinders 4½ inch caliber by 7 inch stroke, brass pistons, valves and valve seats. Wheels of best hickory wood (iron bound), patent iron hubs and wrought iron axles; the whole constructed in a thoroughly reliable manner, and to withstand hard usage in going to or working at fires. Will throw a ½ or ⅝ inch stream 90 to 120 feet. We furnish, without extra charge, 25 feet leading hose and a brass discharge pipe, nozzles, wrenches, etc. The price does not include suction hose, which we furnish at market rates when ordered.

Fig. 245, suitable for discharge hose of 1¼ inch caliber, and suction hose of 2½ inch caliber, each.....	$375 00

Furnished with reel for drag rope, $10 00 extra.

"COLONIAL" FIRE ENGINE, WITH FOLDING BRAKES,

FURNISHED WITH SUCTION HOSE. ROOM ON THE BRAKES FOR 16 MEN.

Fig. 351.

Fig. 351 represents our New and Improved Engine, very compact, durable and strong. It is excellently adapted for the purposes of fire protection to villages, colonies, etc., being convenient, portable and capable of severe and sustained work. The cylinders are of brass, with 5½ inches caliber and 7 inches stroke. The brakes are of side folding design, made of wrought iron, 11 feet in length, and can be operated by 16 men. The wheels are constructed of best hard wood timber, iron bound, of 27 and 33 inches diameter. A reel is also attached for drag rope. The valves and valve seats are of approved pattern and made of gun metal, rendering the machine serviceable in all conditions of climate, and especially suiting it for export. Like all our larger Engines, it is arranged to draw water from the box or tank, when filled from buckets, and also to draft through suction hose from well or reservoir. Weight, 1,400 pounds. This Engine will throw a ⅞ or ¾ inch stream of water 125 feet. The price given below includes outfit of 12 feet suction hose, carried squirrel tail fashion, a brass strainer, brass discharge pipes, extra nozzles, and all requisite wrenches, etc., in complete readiness for service.

SIZE AND PRICE.

Fig. 351, 5½ inch brass cylinders, suitable for discharge hose of 2 inches caliber, and suction hose of 3 inches caliber, each, net	$550 00

No. 1, PIANO STYLE FIRE ENGINE, WITH FOLDING BRAKES,

FURNISHED WITH SUCTION HOSE. ROOM ON THE BRAKES FOR TWENTY MEN.

Fig. 246.

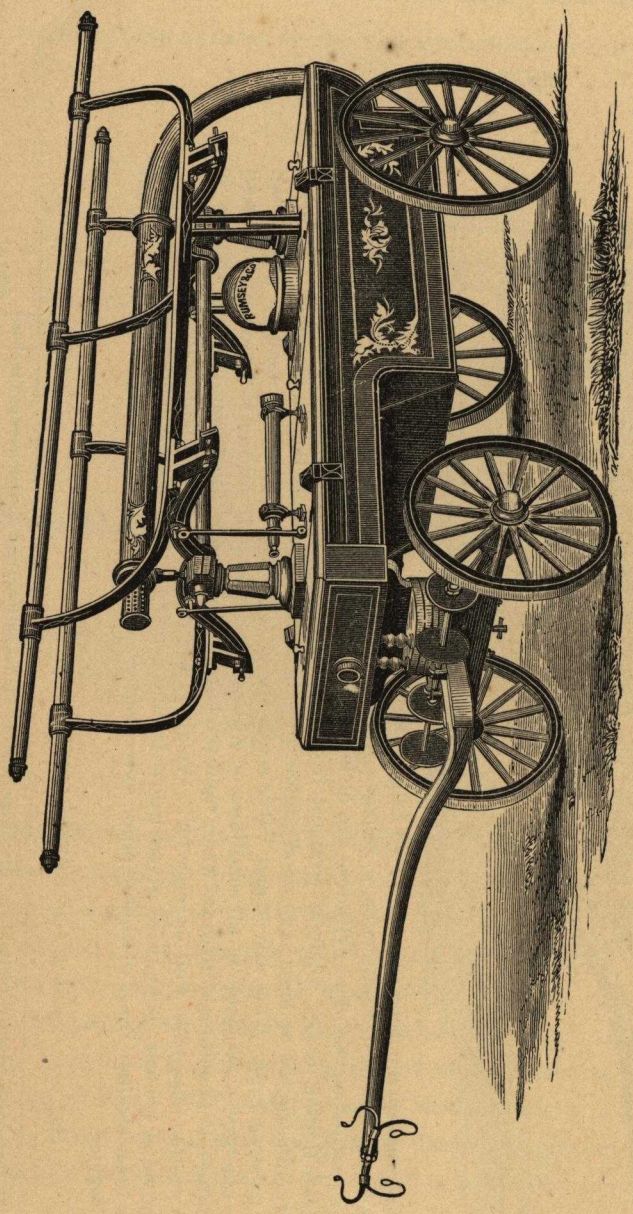


Fig. 246 represents our Piano Style of Fire Engine for small towns and villages, constructed with brass cylinders 6½ and 7 inch caliber, by 7 inches stroke. Folding Brakes of wrought iron 16 feet long, wheels of best seasoned timber (iron bound), 31 and 37 inches in diameter, and a Rope Reel. The valves and valve-seats are of gun metal, and, consequently, are not affected by the dryness or dampness of the atmosphere, as is the case with leather valves used in the ordinary engine, which, when called upon for fire purposes, especially in hot countries, are found to be so hard and dried up that the machine is rendered entirely ineffective for the occasion. It is furnished with 12 feet of Suction Hose, carried squirrel-tail fashion, a brass strainer, brass discharge pipes, extra nozzles and the requisite wrenches, etc., complete for use. This Engine will throw a ¾ or ⅞ inch stream of water about 140 feet. Weight, 1,800 pounds. The 7 inch size throws two streams.

SIZES AND PRICES.

Fig. 246, 6½ inch Brass Cylinders, one stream, suitable for Discharge Hose of 2 inches caliber, and Suction Hose of 3½ inches caliber, each, net	$700 00
Fig. 246, 7 inch Brass Cylinders, two streams, suitable for Discharge Hose of 2 inches caliber, and Suction Hose of 3½ inches caliber, each, net	775 00

No. 2, PIANO STYLE FIRE ENGINE, WITH FOLDING BRAKES,

FURNISHED WITH SUCTION HOSE, Etc. ROOM ON BRAKES FOR TWENTY MEN.

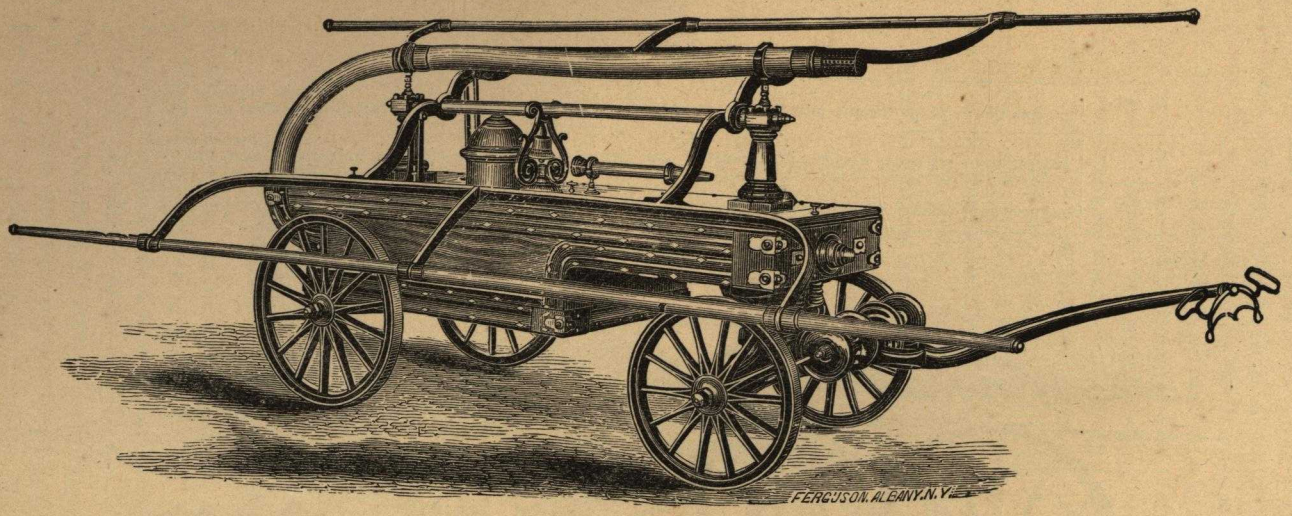


Fig. 247.

Fig. 247 represents our Piano Style of Fire Engine, constructed with working parts similar to Fig. 246, but more highly finished throughout, having a solid mahogany box, with brass corner bands, rope reel, etc., and furnished with 12 feet of suction hose, carried squirrel-tail fashion, with all brass strainer, brass discharge pipes, nozzles, wrenches, etc., complete and ready for use. This Engine will throw a $\frac{3}{4}$ or $\frac{7}{8}$ inch stream of water about 140 feet. Weight, 1,800 pounds. The 7 inch size throws two streams. Dimensions same as Fig. 246.

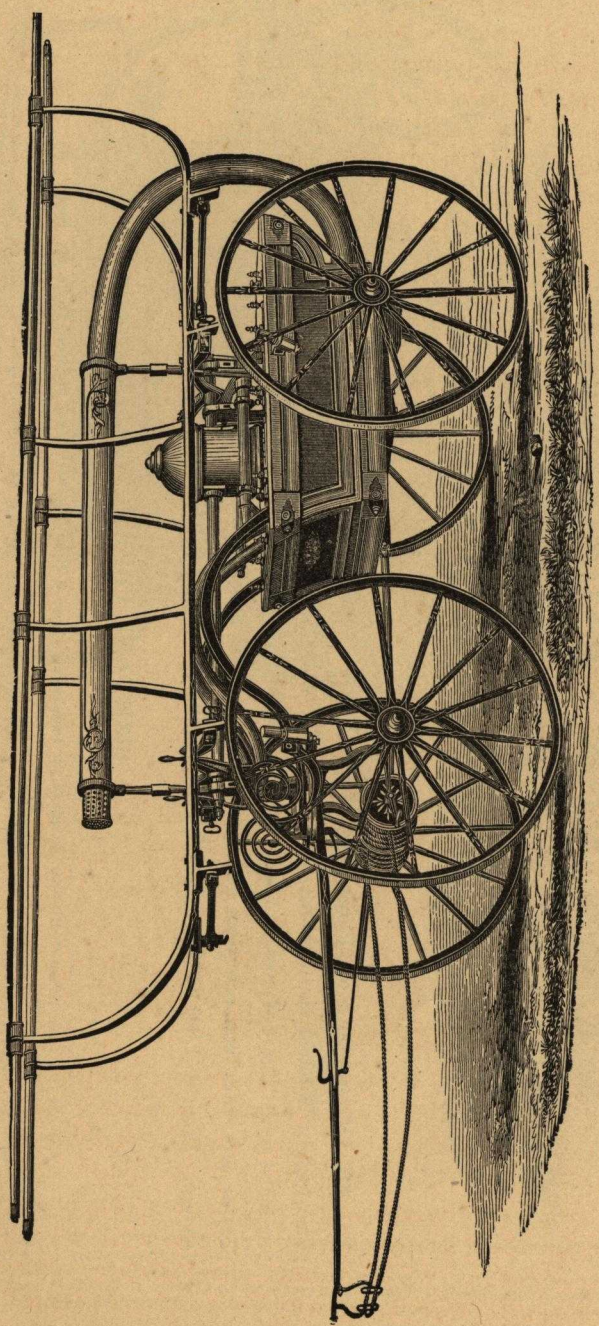
SIZES AND PRICES.

Fig. 247, 6¼ inch Brass Cylinders, suitable for Discharge Hose 2 inch caliber, and Suction Hose 3½ inch caliber, each	$1,000 00
Fig. 247. 7 inch Brass Cylinders, suitable for Discharge Hose 2 inch caliber, and Suction Hose 3½ inch caliber, each, two streams	1,100 00

"CRANE NECK" STYLE FIRE ENGINE, SIDE FOLDING BRAKES,

FURNISHED WITH SUCTION HOSE. ROOM ON BRAKES FOR THIRTY MEN.

Fig. 248.



(For description, see opposite page.)

SIZES AND PRICES.

No. 1, 6½ inch Brass Cylinders, suitable for Discharge Hose 2 inch caliber, and Suction Hose 3 inch caliber, one stream, each	$1,450 00
No. 2, 7 inch Brass Cylinders, suitable for Discharge Hose 2 inch caliber, and Suction Hose 3½ inch caliber, two streams, each	1,550 00
No. 3, 8½ inch Brass Cylinders, suitable for Discharge Hose 2½ inch caliber, and Suction Hose 4 inch caliber, two streams, each	1,850 00

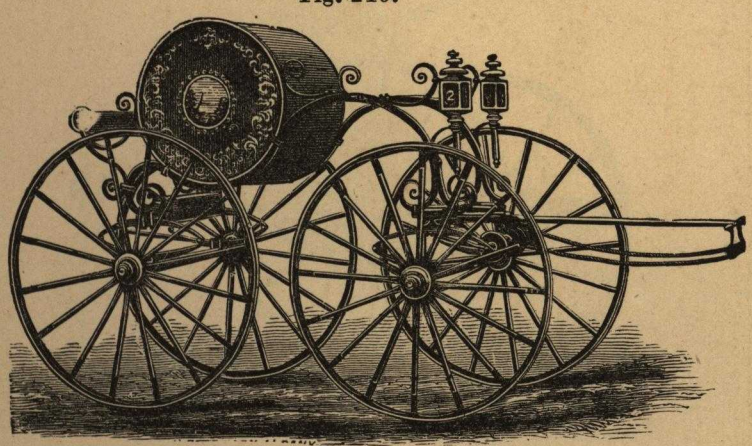
"CRANE NECK" STYLE FIRE ENGINE.

(See opposite page.)

We make three sizes of this superb Engine, respectively with 6½, 7 and 8½ inch Cylinders. (All sizes are built with 7 inch stroke.) In every machine the cylinders, air chamber, piston, valves and valve seats, valve gates, goose neck, discharge pipes, bumper cases, deck knobs, strainer and nozzles are entirely made of finely finished brass; they have also the box and deck of solid mahogany, with brass mountings. Side folding brakes and arm joints are powerfully made of wrought iron. Wheels 44 and 49 inches diameter. The valves are of the best design, and being metallic, are not affected by the dryness or dampness of any climate. Each part is durable, of best material, and built with an especial adaptation to its service. Nos. 1 and 2 have brakes 16 feet long, and throw a ⅞ inch stream about 140 feet. No. 3 has brakes 18 feet long, and will throw a 1 inch stream 175 feet. We send 12 feet of 3 or 3½ inch suction hose with Nos. 1 and 2, and 16 feet of 4 inch suction hose with No. 3. Every machine has also an equipment of 2 discharge pipes, 6 assorted nozzles, 8 wrenches, reel and drag rope, and 2 electro-plated signal lamps with colored glass and name thereon. Engine named and painted in any style or color desired. Nos. 1 and 2 are made for 2 inch, and No. 3 for 2½ inch discharge hose, which we furnish when ordered. These are the best and handsomest Engines made, and will perform more than we promise. Weights, from 2,200 to 2,500 pounds. We build our machines for strength, compactness and efficiency, believing these qualities to be more useful and desirable in a Hand Fire Engine than excessive bulk.

NEW AND IMPROVED STYLE HOSE CARRIAGE.

Fig. 249.

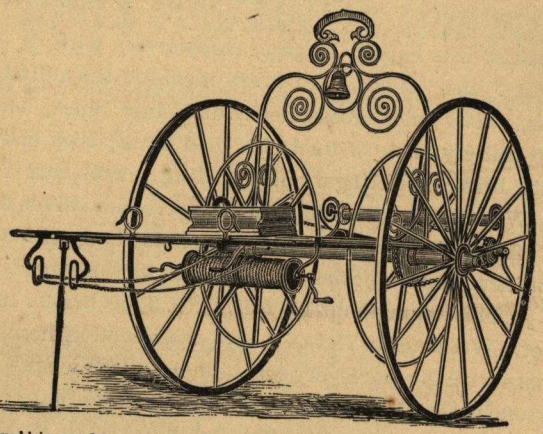


This cut represents our new style "Crane Neck" Hose Carriage, made entirely of metal, except the spokes and covers of the reel heads. They can be turned in their own length, and are the most convenient and serviceable Hose Carriages ever built. Wheels 58 and 60 inches diameter, and the whole frame rides on the best springs. We paint them in any style to suit purchasers, and send them equipped for service, with drag rope, rope reel, tool box, bell, two signal lamps with colored glass, and name and number of company engraved thereon, etc. They are unequaled for utility, beauty and originality of design. We can furnish these Carriages at any price from $300 to $1,600 and upwards, according to the carrying capacity, style and finish desired, and would respectfully invite correspondence from Fire Departments.

BALANCED HOSE CART,

WITH CRANKS AND CHAIN REEL, BELL AND NAME PLATE.

Fig. 250.



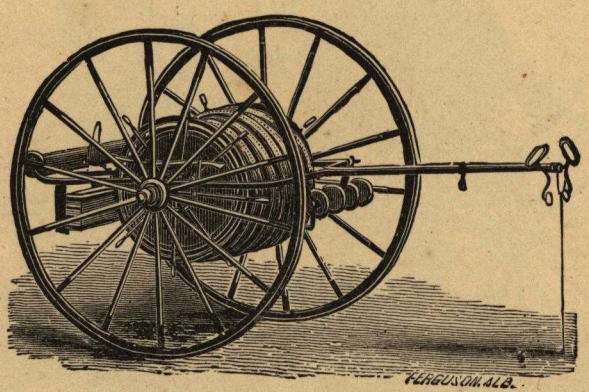
The above Cart, or "Jumper," is made entirely of metal, except the spokes and felloes. Wheels 5½ or 6 feet, as desired, and of the best seasoned timber (iron bound), with 1¾ inches tread. The axles are 2 inches diameter, with reel on axle. It weighs 650 pounds, and has open ends to admit a current of air for drying the hose. Will easily carry 600 feet of 2½ inch heavy engine hose. It is made to wind the hose by cranks and endless chain, this mode being much preferable to reeling by hand. The frame of all our Carts is forged in one piece. Each Cart is furnished with drag rope, reel, tool box, etc. We make two styles, viz: with and without scrolls, bell and name plate, at the following prices:

No. 1, without scrolls, bell and name plate	$210 00
No. 2, with scrolls, bell and name plate	260 00

BALANCED HOSE CART,

WITHOUT SCROLLS AND BELL. TO REEL BY HAND.

Fig. 356.



This Cart has the same size of frame and wheels, and will carry the same quantity of hose as Fig. 250. They are so balanced that there is no weight on the tongue, making them easily handled with a heavy weight of wet hose. Is furnished with handles on end of reel spokes for reeling. Weight, 500 pounds. With each Cart goes drag rope, reel and tool box. They are strong, symmetrical and substantial throughout, painted with handsome designs and unsurpassed for service. We make four styles, viz:

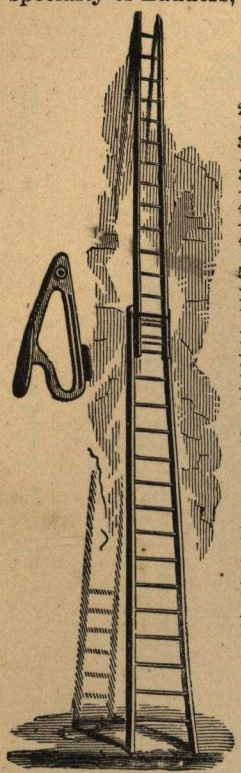
PRICES.

No. 1, 5½ feet wheels, to carry 600 feet of 2½ inch hose	$175 00
No. 2, same as No. 1, with addition of scrolls, bell and name plate	225 00
No. 3, 5 feet wheels, to carry 400 feet of 2 inch hose	125 00
No. 4, same as No. 3, with addition of scrolls, bell and name plate	150 00

We also make a Hose Cart of same general design as Fig. 356, to carry 400 feet of 1½ inch hose. Price, $100 0

PATENT FIRE LADDERS.

Our Fire Ladders are completely ironed, and are warranted to do good service. We make a specialty of Ladders, and we are prepared to furnish them at the lowest market rates.

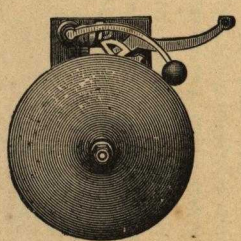


PRICES.

25 foot Extension Fire Ladder	$18 00
30 foot Extension Fire Ladder	21 00
35 foot Extension Fire Ladder	24 00
40 foot Extension Fire Ladder	27 00
45 foot Extension Fire Ladder	35 00
50 foot Extension Fire Ladder	38 00
12 foot Long Fire Ladder	5 00
14 foot Long Fire Ladder	5 75
16 foot Long Fire Ladder	6 75
18 foot Long Fire Ladder	8 50
20 foot Long Fire Ladder	10 75
12 foot Roof Fire Ladder	5 00
14 foot Roof Fire Ladder	5 50
12 foot Pike Poles Fire Ladder	3 50
16 foot Pike Poles Fire Ladder	4 00
18 foot Pike Poles Fire Ladder	4 50
Large Grappling Hook and Chain complete, with Pole	30 00

SIGNAL OR GONG BELLS,

FOR SCHOOL HOUSES, LOCOMOTIVES, HOTELS, STEAMBOATS, ETC.



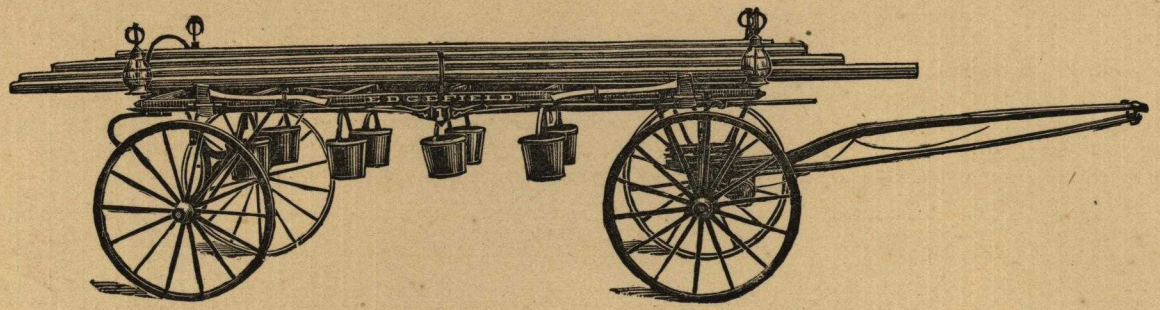
PRICES.

4 inch, polished	$ 2 45
5 inch, polished	2 95
6 inch, polished	3 70
7 inch, polished	4 60
8 inch, polished	5 60
9 inch, polished	6 70
10 inch, polished	7 90
11 inch, polished	9 25
12 inch, polished	11 00
13 inch, polished	12 90
14 inch, polished	15 00
15 inch, polished	18 50
16 inch, polished	23 00
18 inch, polished	28 00
20 inch, polished	33 50

IMPROVED HOOK AND LADDER TRUCK.

LADDERS ON ROLLERS.

Fig. 332.



These Trucks are strong, handsome and durable, and rigged to do excellent service. The tongue can be readily disconnected, so that the house need be only the length of the longest ladder. Can be turned anywhere in their own length.

No. 1. Fitted with Tiller, if so ordered. Wheels 4 feet diameter, with 1¾ inches thread. Weight equipped, 1,400 pounds. Furnished with one Ladder on Rollers, 20 feet long; 3 Ladders in a nest on Rollers, 18, 16 and 14 feet long. The 20 and 18 feet Ladders arranged to splice and make an Adjustable Extension Ladder up to 35 feet long. Four Hand Hooks and Poles, 1 Chain Hook, Rope, Chain and Pole; 2 Plain Axes, 2 Pick Head Axes, 8 Rubber Buckets, 4 Brass Hand Lanterns, Rope Reel and Drag Rope; finely painted and striped, and lettered with name of Company.

Price	$400 00

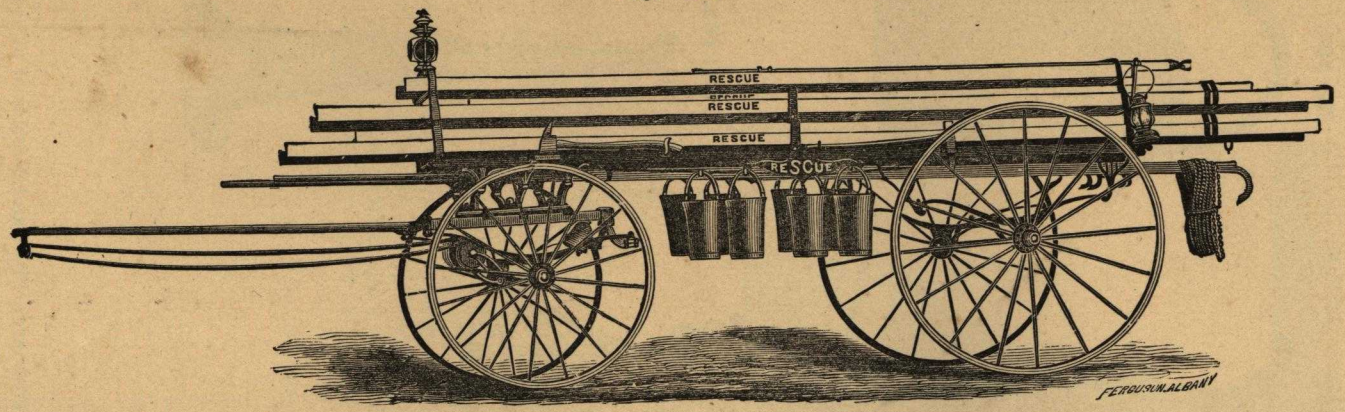
No. 2. Larger and longer than No. 1, and made with Tiller. Wheels 44 inches diameter. Weight, with equipments, 2,000 pounds. Furnished with 2 Ladders on Rollers, 26 and 23 feet long; 3 Ladders in a nest on Rollers, 20, 16 and 12 feet long. The 26 and 23 feet Ladders arranged to splice and make an Adjustable Extension Ladder up to 45 feet long. Four Hand Hooks and Poles, 1 Chain Hook, Rope, Chain and Pole, 2 Plain Axes, 2 Pick Head Axes, 8 Rubber Buckets, 4 Brass Hand Lanterns, Rope Reel and Drag Rope; finely painted and striped, and lettered with name of Company. Hind wheels arranged to turn with Tiller.

Price	$475 00

We also make many other styles, ranging in price up to $2,000.

HOOK AND LADDER TRUCK. ON PLATFORM SPRINGS, LADDERS ON ROLLERS.

Fig. 333.



This is a very complete and handsome Truck, of the most approved design and thorough construction and finish. The tongue can be disconnected. The frame is mounted on the best platform springs, and is arranged to carry extra buckets.

No. 1. Front wheels 4 feet, and rear wheels 5 feet in diameter. Weight, equipped, 950 pounds. Rigged with Tiller, if so ordered. Furnished with one Ladder on Rollers, 20 feet long; 3 Ladders in a nest on Rollers, 18, 16 and 14 feet long. The 20 and 18 feet Ladders arranged to splice and make an Adjustable Extension Ladder up to 35 feet long. Four Hand Hooks and Poles, one Chain Hook, Rope, Chain and Pole; 2 plain Axes, 2 Pick Head Axes, 8 Rubber Buckets, 4 Brass Hand Lanterns, Signal Lamp and Bell, Rope Reel and Drag Rope; handsomely painted and striped, and lettered with name of company.

Price	$525 00

No. 2. Larger and Longer than No. 1; made with Tiller; front wheels 44 inches and rear wheels 56 inches diameter. Weight, 1,250 pounds. Furnished with 2 Ladders on Rollers, 26 and 23 feet long; 3 Ladders in a nest on Rollers, 20, 16 and 12 feet long. The 26 and 23 feet Ladders arranged to splice and make an Adjustable Extension Ladder up to 45 feet long. Four Hand Hooks and Poles, 1 Chain Hook, Rope, Chain and Pole, 2 plain Axes, 2 Pick Head Axes, 8 Rubber Buckets, 4 Brass Hand Lanterns, Signal Lamp and Bell, Rope Reel and Drag Rope; handsomely painted and striped, and lettered with name of Company.

Price	$575 00

No. 2 has hind wheels arranged to turn with Tiller. We also make many other styles, ranging in price up to $2,000.

DISCHARGE PIPES, FIRE BUCKETS, Etc.

Fig. 234.

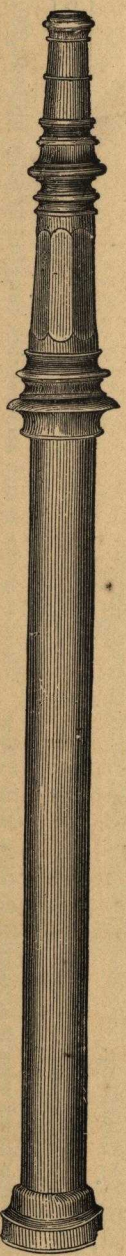


Fig. 339.

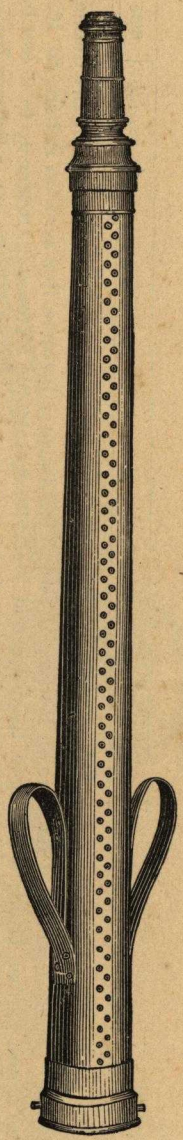


Fig. 233.

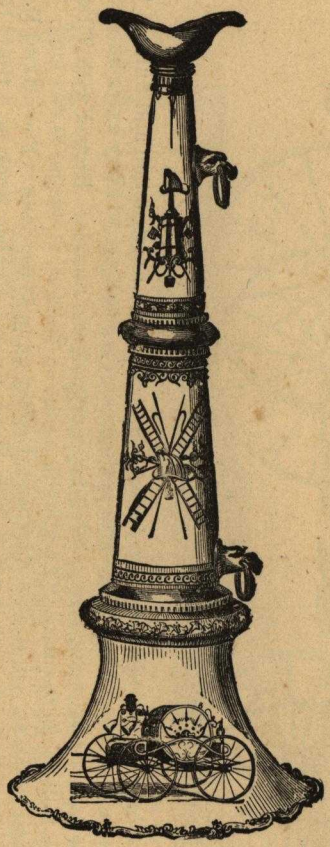
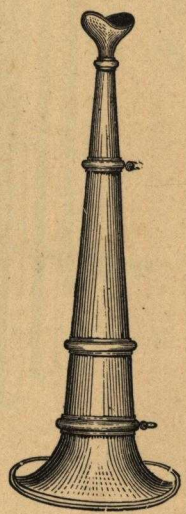


Fig. 235.

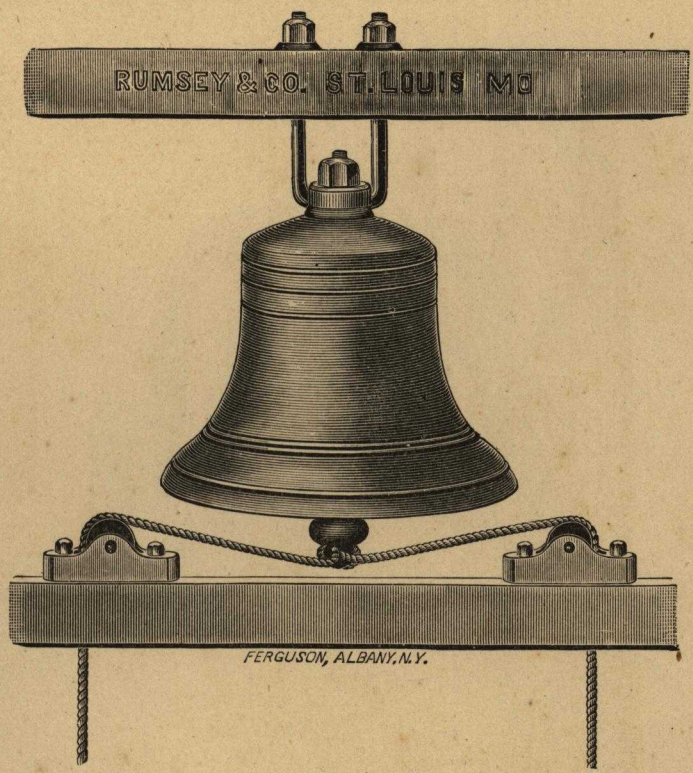
Fig. 232.



We furnish rubber and leather Fire Buckets, and Discharge Pipes and Nozzles of all descriptions. We also supply a large variety of Trumpets, in brass, silver and silver plated, for presentation, parade and duty, engraved with suitable designs. Axes, Hooks, and other apparatus for fire departments, constantly on hand and furnished at lowest market rates. We keep a large stock of rubber, leather, cotton and linen Hose, and fire department supplies of all kinds and best qualities, which we supply at manufacturers' prices. Prices, etc., furnished upon application.

PURE BELL METAL FIRE ALARM BELLS,

WITH STRIKING APPARATUS AND TWO PULLEYS.



The above cut represents our Fire Alarm Bell, in all sizes—27½ inches and upwards—bolted to cross-beam in belfry or tower, with apparatus ready for use. The entire arrangement is simple, cheap and strong. The alarm can be struck upon both sides of the bell, instead of one side, as in other alarms, and with more ease and rapidity. The force of the blow can also be regulated to a nicety, thereby reducing any chance of breakage to the minimum. As will be seen from the cut, there is nothing complicated to create disorder or need repair. The different sizes are fitted with striking apparatus, corresponding to the size and weight of the Bell. These Bells are well adapted, in every respect, for fire alarms. They are made of the same metals as our celebrated Church Bells.* The weights given in the following table are those designating the pattern; the actual weights often vary above and below these:

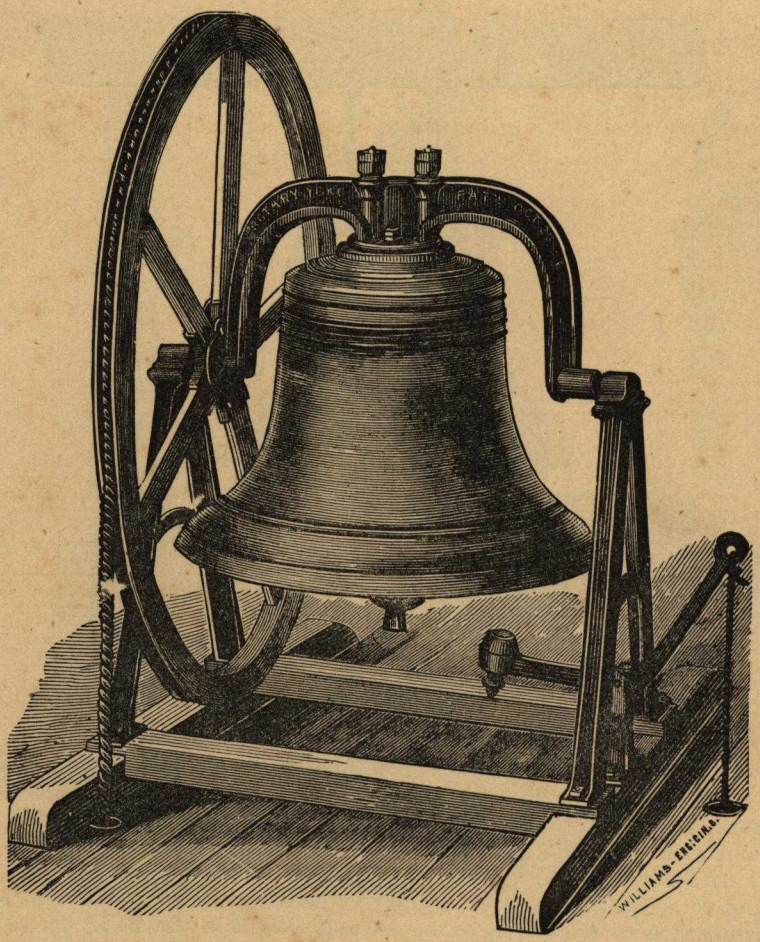
Weight.	Medium Tone.	Diameter of Bell.	Weight.	Medium Tone.	Diameter of Bell.
400 pounds	D	27½ inches.	1,000 pounds	A	37½ inches.
450 pounds	D	28 inches.	1,100 pounds	A	37¾ inches.
500 pounds	C Sharp	29 inches.	1,200 pounds	A Flat.	39¼ inches.
550 pounds	C	30½ inches.	1,300 pounds	A Flat.	40½ inches.
600 pounds	C	31 inches	1,400 pounds	A Flat.	41¼ inches.
650 pounds	C	32 inches.	1,500 pounds	G	41¾ inches.
700 pounds	B	33½ inches.	1,600 pounds	G	42¼ inches.
750 pounds	B	34½ inches	1,700 pounds	F Sharp.	43 inches.
800 pounds	B Flat.	35 inches.	1,800 pounds	F Sharp	43¾ inches.
900 pounds	B Flat.	37 inches.	2,000 pounds	F	46 inches

Hangings, Pulleys, etc., as per above, extra, $10 00.

* These Bells being made of Banca tin and Chili copper, are sold by the pound, and are subject to the same market changes as other metals. Write for prices.

PURE BELL METAL CHURCH BELLS.

Fig. 209.



Of any desired weight, mounted with our Improved Patented Rotary Hangings, by means of which the Bell can be readily turned in the yoke—without unhanging it or deranging the Clapper Springs—so as to present a new point for the stroke of the Clapper, when desired, and thus greatly increasing the durability of the Bell, which, by long-continued use, may become liable to break by the Clapper always striking on the same place.

CLAPPER SPRINGS.—By which the Clapper is prevented from resting on the Bell while swinging up in ringing, thus preserving the vibration clear and distinct, which would otherwise be in a great measure destroyed. The Springs are also separate, so that they can be easily taken out, one or both, without disturbing any of the other parts, and repaired or renewed, if at any time necessary.

WHEEL.—Of ash timber, the arms of which are firmly secured to an iron centre, bolted to the Flange of the Yoke.

TOLLING HAMMER.—With Iron Standard, bolted to the frame. All of which make a complete set of hangings for ringing and tolling, and are carefully gotten up with reference to neatness and durability.

GUARANTEE.—We call attention to the fact that we give, with every Bell of one hundred pounds and upward, a Signed Guarantee that it shall be of Pure Bell Metal, and of satfsfactory Tone, and not to break for one year from the time of purchase; and should the Bell break while being rung or tolled in the proper manner, within the year, we obligate ourselves to recast it without charge.

CHURCH BELLS.

In the table below will be found a list of our Church Bells, the range within which they are toned, diameter of Bell, size of frame, diameter of wheel, and cost of the hangings for each sized Bell. The weights given below, in the following table, are those designating the pattern; the actual weights often vary above and below these.

Weight.	Medium Tone.	Diameter Bell.	Size of Frame, Outside.	Diameter of Wheel.	Price of Mountings.
400 pounds	D	27⅛ inches.	3 feet 1½ inches.	4 feet.	$ 28 00
450 pounds	D	28 inches.	3 feet 2¼ inches.	4 feet.	30 00
500 pounds	C Sharp.	29 inches.	3 feet 3⅛ inches.	4 feet.	32 00
550 pounds	C Sharp.	30⅛ inches.	3 feet 5 inches.	4 feet.	35 00
600 pounds	C	31 inches.	3 feet 6 inches	4 feet.	35 00
650 pounds	C	32 inches.	3 feet 7 inches.	4 feet.	35 00
700 pounds	B	33⅛ inches.	3 feet 8½ inches.	4 feet.	40 00
750 pounds	B	34⅛ inches.	3 feet 9½ inches	4 feet.	40 00
800 pounds	B Flat.	35 inches.	3 feet 11 inches.	4 feet.	40 00
900 pounds	B Flat.	37 inches.	4 feet 0 inches.	4 feet.	45 00
1,000 pounds	A	37⅛ inches	4 feet 1 inch.	4 feet.	45 00
1,100 pounds	A	37¾ inches.	4 feet 2 inches.	4 feet.	45 00
1,200 pounds	A Flat.	39⅛ inches	4 feet 3 inches.	4 feet.	50 00
1,300 pounds	A Flat.	40⅛ inches.	4 feet 4 inches.	4 feet.	50 00
1,400 pounds	A Flat.	41¼ inches.	4 feet 5½ inches.	4 feet.	60 00
1,500 pounds	G	41¾ inches.	4 feet 7 inches.	4½ feet.	60 00
1,600 pounds	G	42½ inches.	4 feet 8 inches.	4½ feet.	65 00
1,700 pounds	F Sharp.	43 inches.	4 feet 9 inches.	4½ feet.	75 00
1,800 pounds	F Sharp.	43¾ inches.	4 feet 9½ inches.	4½ feet.	75 00
2,000 pounds	F	46 inches.	6 feet 6 inches.	4½ feet.	85 00
2,200 pounds	F	47½ inches.	6 feet 6 inches.	4½ feet.	90 00
2,300 pounds	F	48 inches.	6 feet 6 inches.	4½ feet.	95 00
2,500 pounds	E	50½ inches.	6 feet 6 inches.	5 feet.	100 00
2,800 pounds	E	52 inches.	6 feet 6 inches.	5 feet.	110 00
3,000 pounds	E Flat.	54 inches.	6 feet 6 inches.	5½ feet.	115 00
3,300 pounds	E Flat.	55¾ inches.	6 feet 6 inches.	5½ feet.	125 00
3,500 pounds	D	56¾ inches.	6 feet 6 inches.	6 feet.	125 00
4,000 pounds	D	59 inches.	7 feet 6 inches.	6 feet.	140 00
4,500 pounds	C Sharp.	60⅛ inches.	7 feet 6 inches.	6 feet.	150 00
5,000 pounds	C	63¼ inches.	7 feet 6 inches.	6½ feet.	160 00
6,000 pounds	B	66¼ inches.	8 feet 6 inches.	6½ feet.	175 00

The above prices are for hangings only; the Bells, being made of Banca Tin and Chili Copper, are sold by the pound, and are subject to the same market changes as other metals. Write for quotations.

ACADEMY, FACTORY, STEAMBOAT AND PLANTATION BELLS.

Fig. 210.

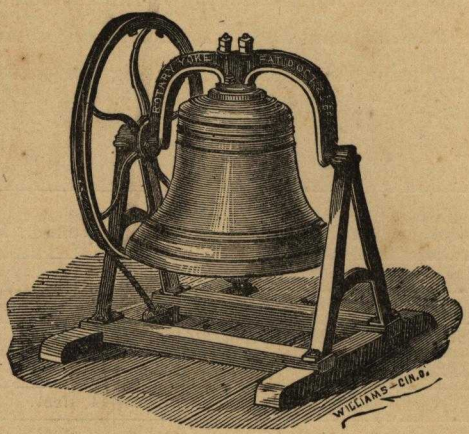
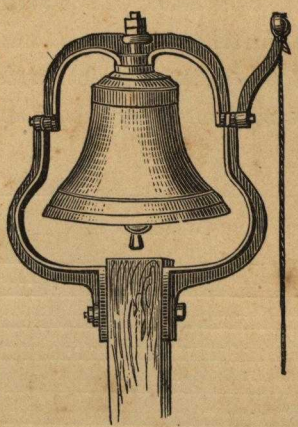


Fig. 211.



Ranging from 100 pounds to 350 pounds, mounted on our Improved Patent Rotary Hangings, by means of which the Bell can be readily turned in the Yoke, so as to present a new point for the stroke of the Clapper, when desired. Frame of Ash timber, Iron Stands, Clapper Springs and Iron Wheel.

FIG. 210.—BELLS.		HANGINGS.	
Weight.	Diameter.	Size of Frame.	Price Hangings.
100 pounds	17 inches.	1 foot 11 inches.	$ 13 00
125 pounds	18½ inches.	2 feet 1 inch.	13 00
150 pounds	20 inches.	2 feet 2 inches.	14 00
175 pounds	21 inches.	2 feet 4 inches.	20 00
200 pounds	22¼ inches.	2 feet 5 inches.	20 00
225 pounds	23 inches.	2 feet 5 inches.	20 00
250 pounds	24 inches.	2 feet 6 inches.	22 50
300 pounds	26 inches.	2 feet 8 inches.	23 00
350 pounds	27 inches.	2 feet 9 inches.	25 00
375 pounds	27 inches.	2 feet 9 inches.	27 00

FIG. 211.—SCHOOL HOUSE, FARM AND HOTEL BELLS.

Ranging from 15 to 90 pounds, mounted with our Patent Rotary Yoke Frame, Lever and Bolt, making a complete set of Hangings.

Weight.	Price Hangings.	Weight.	Price Hangings.
15 pounds	$ 2 00	50 pounds	$ 3 50
20 pounds	2 25	60 pounds	3 75
25 pounds	2 50	70 pounds	4 00
30 pounds	2 75	80 pounds	4 00
35 pounds	3 00	90 pounds	4 50
40 pounds	3 25		

The above prices are for Hangings only; the Bells, being made of Banca Tin and Chili Copper, are sold by the pound, and are subject to the same market changes as other metals. Write for quotations.

SECTION VIEWS OF CISTERN AND PITCHER PUMPS.

Fig. 254. Cistern Pump.

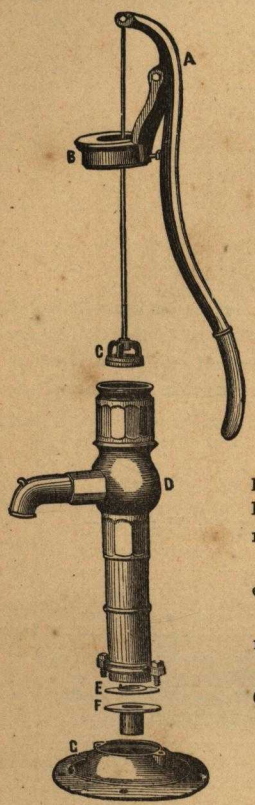


Fig. 254.

A—Lever.
B—Fulcrum.
C—Plunger.
D—Cylinder.
E—Lower Valve.
F—Brass Tube.
G—Base.

Fig. 255. Pitcher Pump.

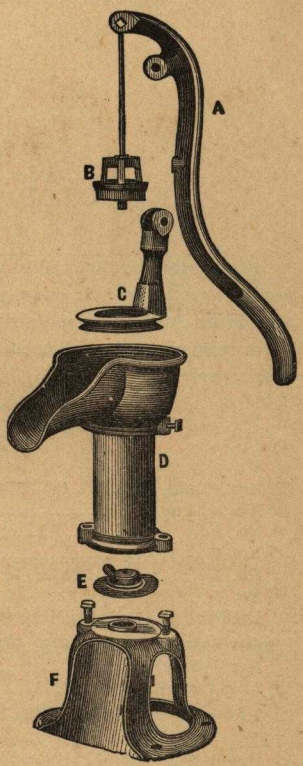


Fig. 255.

A—Lever.
B—Plunger.
C—Fulcrum.
D—Cylinder.
E—Lower Valve.
F—Base.

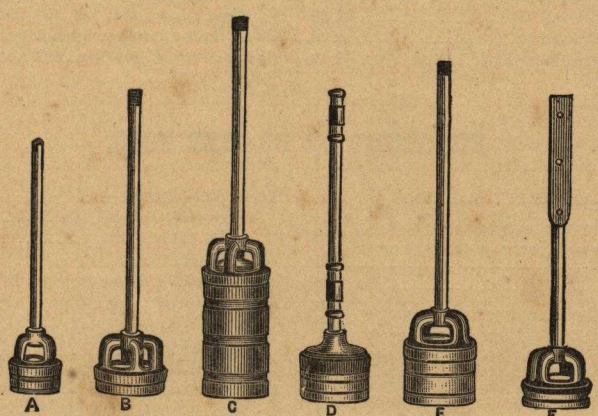
Fig. 254 represents a Cistern Pump, with its various parts shown separately. The part shown as letter D is known as cylinder in Cistern Pumps, but as stock or barrel in Well Pumps.

Fig. 255 represents a Pitcher Spout Pump with its various parts shown separately.

Be sure and mention Figure and Letter, when ordering repairs.

For complete List of repairs, see pages 662, 663, 664, 665, 666 and 667.

PLUNGERS.



The above engravings show the different styles of Plungers used in our working barrels, or cylinders.

A, is an all brass Plunger, with brass "wing" valve and leather packing, the bottom part turned and fitted to its cylinder. It is used in all brass cylinders less than 10½ inches long.

B, is an ordinary iron Plunger, with leather packing and wing valve. Used in all shallow well iron cylinders, such as Fig. 123.

C, is our "Artesian" well Plunger, brass top, brass wing valve; iron bottom 5 inches long, grooved to reduce friction and increase its efficiency. In this Plunger is contained all the experience of the ablest hydraulic engineers of the present age. We put it in all cylinders of 12 inches in length and upwards, such as Figs. 124, 125 and 257.

D, is our new style, all brass Plunger, consisting of a bottom turned to fit the cylinder, and top beveled to fit into the bottom in such a manner that the more it is forced downward, the more surface of the packing is forced against the walls of the cylinder; the rod extends entirely through the Plunger, and on it is a common disc or gravity valve, which covers the whole surface.

E, represents our deep well Plunger, brass top, iron bottom 2 inches long, grooved, wing valve; a good, reliable Plunger, for all cylinders, but used principally in Fig. 124.

PUMP REPAIRS.

In the following List will be found prices of pieces for all the leading Pumps we make, which dealers will find of decided convenience. In this connection we desire to impress most emphatically on the minds of dealers that all our threads are cut to exact and accurate gauges; all holes in flanges, etc., drilled to templets; all castings made from exact metal patterns, similar parts being always the same. Therefore, repairs will invariably take the place of the broken parts.

LEVERS OR HANDLES.

Cistern Pumps, Figs. 101, 102, 177 and 177½—	
Nos. 0, 1 and 2	$0 50
No. 3	60
No. 4	70
No. 5	1 00
No. 6	1 25
No. 7	1 50
Pitcher Pumps, Figs. 99, 99½, 103 and 104—	
Nos. 1, 2 and 3	50
Nos. 4 and 5	75
Anti-Freezing Well Pumps, Figs. 105 to 109, inclusive—	
Nos. 2 and 3	75
Nos. 4, 4½, 30 and 31	85
Yard Well Pumps, Figs. 110 and 111	1 50
Yard Well Pumps, Figs. 112 and 113	2 00
Anti-Freezing Force Pumps, Fig. 114½	1 50
Engine Well Force Pumps, Figs. 115, 117 and 118—	
Nos. 6½ and 7½	$1 50
Nos. 8 and 8½	2 00
Yard Well Pump Standard—	
Figs. 119 and 120	2 00
Figs. 121 and 122	2 50
Figs. 299 and 308	1 75
Iron and Brass House Force Pumps—	
Figs. 128, 141, 142, 143, 144, 145, 187, 188, 290 and 291.	2 00
Hand Force Pumps, Figs. 129 to 140, inclusive—	
2½ and 3 inch cylinders	1 00
4 inch cylinder	1 50
Railroad Force Pump, Fig. 150	1 50
Wind Mill Pumps—	
Figs. 54, 68, 281, 282, 283, 284, 285, 286, 288, 317, 318.	1 50
Hand Boiler Pumps, Figs. 161 and 295	1 00
Handle Socket, for Fig. 289	1 00

FULCRUMS OR BEARER TOPS.

Cistern Pumps, Figs. 101, 102, 104, 177 and 177½—	
Nos. 0, 1 and 2	$0 70
No. 3	75
No. 4	80
No. 5	90
No. 6	1 10
No. 7	1 50
Pitcher Pumps, Figs. 99 and 103—	
Nos. 1 and 2	40
Nos. 3 and 4	50
No. 5	60
Pitcher Pumps, Fig. 99½—	
Nos. 1 and 2	60
Nos. 3 and 4	80
No. 5	1 00
Anti-Freezing Well Pumps, Figs. 105, 106 and 109—	
No. 2	75
Nos. 3 and 4	80
No. 4½	90
Anti-Freezing Tight-Top Well Pumps, Fig. 107—	
Nos. 2, 3 and 4	1 25
No. 4½	1 50
Drive Well Pumps, Figs. 106½ and 108½	1 00
Yard Well Pumps—	
Figs. 110, 112 and 119	1 50
Figs. 111 and 120	2 00
Fig. 113	2 25
Anti-Freezing Force Pumps, Fig. 114½	1 25
Engine Well Pumps, Figs. 115, 117 and 118—	
Nos. 6½ and 7½	1 25
Nos. 8 and 8½	1 50
Deep Well Pumps, Figs. 121 and 122	2 25
Iron and Brass House Force Pumps—	
Figs. 128, 141, 142, 143, 144, 145, 187, 188, 290, 291.	1 50
Hand Force Pumps, Figs. 129 to 140, inclusive—	
With 2½ and 3 inch cylinders	1 00
With 4 inch cylinders	1 50
Railroad Force Pumps, Fig. 150	1 50
Wind Mill Pumps, Figs 54, 283 and 284—	
6 inch stroke	1 50
10 inch stroke	2 00
Figs 68 and 285, 6 inch stroke	2 00
10 inch stroke	2 50
Figs. 281, 282, 317 and 318—	
Nos. 1 and 2	2 00
No. 3	2 50

PUMP REPAIRS—Continued.

PLUNGERS, WITH RODS.

Cistern Pumps, Figs. 101, 102 and 104—

No. 0	$0 70
No. 1	75
No. 2	80
No. 3	90
No. 4	1 00
No. 5	1 15
No. 6	1 30
No. 7	1 50

Pitcher Pumps, Figs. 99, 99½ and 103—

No. 1	$0 75
No. 2	80
No. 3	90
No. 4	1 00
No. 5	1 25

PLUNGERS ONLY—NO RODS.

Inches.	2¼	2½	2¾	3	3¼	3½	3¾	4
"A" style (Gas Set)	$0 70	$0 75	$0 80	$0 90	$1 00	$1 10	$1 20	$1 25
"B" style (Shallow Well)	2 00	2 10	2 10	2 30	2 45	2 70	2 95	3 20
"C" style (Deep Well)	2 30	2 45	2 70	2 95	3 20	3 45	3 60	3 95
"E" style	2 10	2 25	2 40	2 50	2 60	2 75	2 90	3 10
"F" style (Wood Pumps)				90	1 00	1 10		

Hand Force Pumps, Figs. 130 to 140, inclusive—

2½ and 3 inch cylinders	$1 00
4 inch cylinders	1 25

Wind Mill Pumps, Figs. 281 and 282—

2½ and 3 inch cylinders	1 00
4 inch cylinders	1 25

Railroad Force Pumps—

Figs. 148, 149 and 150	1 25
Figs. 146 and 147	1 75

Hand Boiler Pumps, Figs. 161 and 295	2 75
Iron House Force Pumps—Figs. 62, 128, 141, 142, 276 and 290	1 00

Brass and Brass Cylinder House Force Pumps—

Figs. 62, 141, 142, 276 and 290	2 00

Brass Cylinder Hand Force Pumps, Figs. 130 to 140, inclusive—

2½ and 3 inch	2 00
4 inch	3 00

"Excelsior" Force Pumps—

Figs. 274, 275, 314, 315 and 316	$1 50
Ship Main Pumps, Figs. 262 and 263	7 00

Two Cylinder Force Pumps, Fig. 261—

2½ inch cylinder	2 25
3 inch cylinder	3 00
4 inch cylinder	4 00
5 inch cylinder	5 00
6 inch cylinder	6 00

Double-Acting House Force Pumps—

Figs. 144 and 145	1 50

Double-Acting Tank Pumps, Figs. 65, 157, 158, 159, 260, 278 and 313—

2, 2½, 3, 3½ and 4 inch cylinder	1 50
4½ and 5 inch cylinder	1 75
6 inch cylinder	2 00

CYLINDERS.

Cistern Pumps, Figs. 101, 102 and 104—

Nos. 0 and 1	$1 25
No. 2	1 50
No. 3	1 75
No. 4	2 00
No. 5	2 25
No. 6	2 50
No. 7	3 00

Pitcher Pumps, Figs. 99, 99½ and 103—

No. 1	1 50
No. 2	1 75
No. 3	2 00
No. 4	2 25
No. 5	2 50

Iron Hand Force Pumps, Figs. 130 to 140, inclusive, and Figs. 161, 281, 282 and 295—

2, 2½ and 3 inch	3 00
4 inch	6 50

Iron House Force Pumps, Figs. 62, 141, 142, 143, 146, 147, 276 and 290—

2 inch	$3 50
2½ inch	4 00
3 inch	4 50
3½ inch	6 00
4 inch	7 50
5 inch	10 00

Iron House Force Pumps, Double-Acting, Figs. 65, 144, 145, 157, 158, 159, 260, 276, 278 and 291—

2 inch	4 00
2½ inch	5 50
3 inch	6 50
3½ inch	8 00
4 inch	11 00
4½ inch	14 00
5 inch	18 00
6 inch	25 00

BASES.

Cistern Pumps, Figs. 101, 104 and 177—

Nos. 0, 1 and 2	$0 75
No. 3	0 85
Nos. 4 and 5	1 00
No. 6	1 25
No. 7	1 50

Pitcher Pumps, Figs. 99, 99½ and 103—

No. 1	1 00
No. 2	1 10
No. 3	1 25
No 4	1 50
No. 5	1 75

Anti-Freezing Well Pumps, Figs. 105, 106, 107, 109—

No. 2	$0 75
No. 3	85
Nos. 4 and 5	1 00

Yard Well Pumps—

Figs. 110 and 111	1 00

Hand Force Pumps, Figs. 129, 130, 131, 132, 133, 134, 150, 281, 292 and 295—

2 and 2½ inch cylinders	1 00
3 inch cylinder	1 25
3½ and 4 inch cylinders	1 50

PUMP REPAIRS—Continued.

POWER VALVES.

Cistern Pumps	$0 25	Yard Well and Set Length Force Pumps	$0 30
Pitcher Pumps	0 35	Iron and Brass Hand Force Pumps	0 25
Anti-Freezing Well Pumps	0 25	Deep Well Pumps	0 35

BRASS VALVE SEATS.

Cistern Pumps, Figs. 101, 102 and 104—		Pitcher Pumps, 99, 99½ and 103—	
Nos. 0, 1, 2, 3 and 4	$0 75	No. 3	$1 10
No. 5	1 00	No. 4	1 20
No. 6	1 25	No. 5	1 30
No. 7	1 50	House and Hand Force Pumps—	
Pitcher Pumps, 99, 99½ and 103—		2 and 2½ inch	1 00
No. 1	0 75	3 inch	1 25
No. 2	0 90	4 inch	1 50

BRASS SOLDERING TUBES.

For 1 and 1¼ inch pipe	$0 50
For 1½ inch pipe	0 75
For 2 inch pipe	1 00

CYLINDER TOP ATTACHMENTS, OR CAPS.

Anti-Freezing Well and Set Length Force Pump Cylinders, Figs. 123 and 259	$0 50
Deep Well Pump Cylinders, Figs. 124, 125, 257 and 310	0 75

CYLINDER BOTTOM ATTACHMENTS, OR CAPS.

Anti-Freezing and Deep Well Pump Cylinders, Figs. 123, 124, 125, 257, 258 and 259—	
2, 2¼, 2½, 2¾, 3 and 3¼ inch	$0 75
3½, 3¾, 4 and 4½ inch	0 90

SHELL, OR BODY OF CYLINDERS.

INSIDE DIAMETER, INCHES.

	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	5 in.
Figs. 123 and 259—												
9 inches long	$1 50	1 50	1 60	1 80	2 00	2 25	2 50		3 25	3 50		
10½ inches long	1 90	1 90	2 00	2 25	2 45	2 75	3 00		3 75	4 00		
Figs 124, 125, 257 and 310—												
13 inches long	2 25		2 45	2 45	2 75		3 25		3 80		4 10	4 50
14½ inches long	2 50		2 70	2 70	3 00		3 55		4 10		4 40	5 00
16 inches long	2 65	2 80	3 05	3 20	3 45	3 80	4 05	4 15	4 40		4 80	
18 inches long	2 90	3 00	3 35	3 75	4 00		4 60	4 75	4 90			

STOCKS OR STANDARDS COMPLETE.

Anti-Freezing Well Pumps, Figs. 105 and 106—		Anti-Freezing Tight Top, Fig. 107—	
No. 2	$3 75	Nos. 3 and 4	$5 00
Nos. 3 and 4	4 25	No. 4½	5 50
No. 4½	4 75	Drive Well Pumps, with Brace, Open Top, Fig. 106½—	5 00
Fig. 108½, Drive Well Pump, with Brace	4 75	Drive Well Pumps, with Brace, Tight Top, Fig. 106½	5 75

PUMP REPAIRS—Continued.

STOCKS OR STANDARDS ONLY.

Anti-Freezing Well Pumps, Figs. 105, 106, 107, 109—	
Nos. 1 and 2	$2 00
No. 3	2 40
No. 4	2 60
No. 5	2 75
Fig. 106½	3 75
Fig. 108½	3 50
Anti-Freezing Force Pump, Fig. 114½	6 00
Yard Well Pumps, Figs. 110 and 111	4 00
Deep Well Pumps, Figs. 299 and 308—	
Top Section	3 00
Bottom Section	4 00
Engine Well Pump, Fig. 117—No. 8	5 00
Figs. 115, 118 and 273—No. 6½	6 00
No. 7½	6 50
No. 8½	7 50
Wind Mill Force Pumps, Fig. 283—	
No. 31	$4 00
No. 32	4 75
No. 33	5 50
No. 7 (extra large)	6 50
Wind Mill Pumps, Figs. 284 and 285—	
Top Section	2 40
Bottom Section	3 60
Wind Mill Force Pump, Fig. 68—	
No. 6½	6 00
No. 7½	6 50
No. 8½	7 50
Fig. 286	6 00
Deep Well Force Pumps, Fig. 319 and 320	6 50

CAPS AND STUFFING BOXES.

	Caps.	Stfg. B.
Deep Well Pumps—		
Fig. 299	$0 50	
Fig. 308	0 75	$0 50
Hand Force Pumps, Figs. 130 to 140, incl've—		
2½ and 3 inch cylinder	0 50	1 00
4 inch cylinder	0 65	1 00
Iron House Force Pumps, Figs. 128, 141, 142, 143, 144, 145, 290 and 291—		
Up to and including 3½ inch cylinders	0 65	1 00
4 and 4½ inch cylinders	0 75	1 00
Anti-Freezing Force Pumps, Figs. 114½, 115, 117, 118, 68, 285 and 286, C. & S. B.		$1 50
Brass House Force Pumps, Figs, 141, 142, 187, 188 and 290—		
2, 2½ and 3 inch cylinders	$2 25	1 00
3½ and 4 inch cylinders	3 00	1 00
Hand Boiler Pumps, Figs. 161 and 295	0 50	1 00
Two Cylinder Force Pumps, Fig. 261—		
2½ and 3 inch cylinders	1 00	1 50
4 and 5 inch cylinders	1 25	1 75
6 inch cylinder	1 50	2 50

AIR CHAMBERS.

Deep Well Force Pumps, Fig. 308	$3 00
Figs. 68, 115, 117, 118, 273 and 285—	
Nos. 6½ and 7½	2 50
No. 8½	3 00
Iron Hand Force Pumps, Figs. 62, 128, 131, 132, 133, 134, 137, 138, 139, 140, 142, 143, 150, 281, 282, 289 and 290—	
2, 2½ and 3 inch cylinders	2 00
4 inch cylinders	2 50
Double-Acting Force Pumps, Figs. 65, 145, 157, 158, 278 and 291—	
2, 2½, 3 and 3½ inch cylinders	$2 00
4 and 4½ inch cylinders	3 50
5 and 6 inch cylinders	5 00
"Excelsior" Force Pumps—	
3 and 4 inch cylinders	1 50
5 inch cylinder	2 75
6 inch cylinder	3 50

BRACES.

Braces, each	$0 50

SPOUTS.

Figs. 114½, 115, 117, 118, 68, 129, 134, 140, 273, 285, 286, 289, 299, 303 and 308	$0 50

CAST IRON SET LENGTHS.

Yard Well Pumps, Fig. 105—	
Nos. 1, 2 and 3	$2 00
Nos. 4 and 4½	2 25
Fig. 109—Nos. 2 and 3	2 25
Yard Well Pumps—	
Fig. 109—No. 4	$2 75
Figs. 110, 111 and 117	3 00
Figs. 112 and 113	4 50

RAM VALVES AND CASES, MADE OF GUN METAL.

No. 2	$3 00
No. 3	5 00
No. 4	6 00
No. 5	10 00
No. 6	$15 00
No. 7	20 00
No. 8	25 00

PUMP REPAIRS—Continued.

SET SCREWS, BASE AND LEVER BOLTS.

For all kinds Cistern and Pitcher Pumps, each	$0 08

CROSS HEADS, INCLUDING NUTS, SET SCREWS AND LINKS.

	Cross Heads, Etc.	Links.
Figs. 107, 111, 113, 114½, 115, 117, 118, 120, 121, 122, 273, and all Hand Force Pumps up to and including 3 inch	$0 50	$0 25
4 inch Force Pumps	0 60	0 30

PISTON AND CONNECTING RODS.

	Polished Iron.	Brass.
For Well and Hand Force Pumps	$0 60	$1 00
For Wind Mill Force Pumps, Figs. 68, 281, 282, 285 and 286	0 60	1 50
Short Flat Rods, such as for Figs. 68, 281, 282, 285, 286, etc.	0 60	
Long Flat Rods, such as for Figs. 54, 283, 284, 288, 289, etc.	0 75	

IRON PIPE NUTS, FOR CISTERN AND PITCHER PUMPS, SPOUT, HOSE AND AIR CHAMBER NUTS.

For 1 and 1¼ inch	$0 35
For 1½ inch	0 45
For 2 inch and over	0 60

LEAD PIPE NUTS, CISTERN AND PITCHER PUMPS.

For 1 and 1¼ inch	$0 25
For 1½ inch	0 35
For 2 inch and over	0 50

MISCELLANEOUS REPAIRS.

Turned Malleable Pins for Wind Mill Pumps	$0 15
Connecting Slides or Wind Mill Attachments	0 50
Coupling for Connecting Flat and Round Rods	0 50
Harp for House Force Pumps	0 75
Bolt and Brass Nut for Fulcrum of House Force Pumps	0 50

"EXCELSIOR" PUMPS.—Figs. 274, 275, 314, 315, 316 and 319.

	2½ inch.	3 inch.	4 inch.	5 inch.	6 inch.
Cylinder with 2 Valves and 2 Bushings	$11 00	$11 00	$12 00	$17 00	$18 00
Bed Plate with 2 Valve Seats	3 00	3 00	3 50	5 50	6 00
Air Chamber	1 50	1 50	1 50	2 75	3 00
Piston Rod, except Figs. 314 and 316	1 50	1 50	1 50	2 00	2 00
Piston complete, with Leathers	2 00	2 00	2 00	3 50	4 00
Front Cylinder Head	1 00	1 00	1 00	2 00	2 00
Back Cylinder Head	0 90	0 90	0 90	1 75	1 75
Stuffing Box Cap, Brass	0 50	0 50	0 50	1 00	1 25
Stuffing Box Gland	0 25	0 25	0 25	0 75	0 75
Poppet Valves, Gun Metal, each	0 50	0 50	0 50	0 80	1 00
Leather Valves, each	1 25	1 25	1 25	1 50	1 50
Lever Socket	0 75	0 75	0 75	1 25	1 25
Wrought Iron Lever, Wood Handle, each	1 50	1 50	1 50	2 00	2 00
Fulcrum	0 25	0 25	0 25	0 35	0 35
Suction Hose, ⅜ Coupling	0 90	0 90	1 10	1 75	2 50
Discharge Hose, ½ Coupling	0 75	0 75	0 90	1 10	1 75
Long Bolt for Fulcrum, each	0 25	0 25	0 25	0 30	0 40
Lever Bolts, each	0 15	0 15	0 15	0 20	0 20
Crimped Leather Packings, each	0 30	0 30	0 40	0 60	0 70
Brass Bushings for Suction and Discharge	0 50	0 50	0 50	0 75	1 00
Brass Thumb Screws, each	0 25	0 25	0 25	0 35	0 35

PUMP REPAIRS—Continued.

HAND ROTARY FORCE PUMPS.—Figs. 196 and 320.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Case, Cover and Stuffing Boxes	$8 00	$9 00	$10 00	$15 00	$17 00
Cams, each	3 50	4 00	4 50	6 00	6 50
Base, including Leather Valve	3 00	3 00	3 50	4 00	5 50
Spout and Caps	1 00	1 00	1 50	2 00	2 50
Balance Wheel for Fig. 196	1 00	1 00	....	1 00	....
Balance Wheel for Fig. 320	2 00	2 00	2 00	3 00	3 00

EXTRAS, WHEN SENT SEPARATE.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Valves, Leather, each	$0 25	$0 25	$0 25	$0 50	$0 50
Stuffing Boxes and Tight Caps, each	0 35	0 35	0 35	0 35	0 35
Brass Thumb Screws, each	0 25	0 25	0 25	0 25	0 25
Round Head Machine Screws, each	0 03	0 03	0 03	0 03	0 03
Square Head Machine Screws, each	0 04	0 04	0 04	0 04	0 04

These prices apply to extras for Fig. 197 also.

FIG. 197.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Case, Cover, Stuffing Boxes and Caps	$8 00	$9 00	$10 00	$15 00	$17 00
Cam, with Short Shaft	3 50	4 00	4 50	6 00	6 50
Cam, with Long Shaft	5 00	5 50	6 00	7 50	8 00
Small Base	1 50	1 75	1 75	....	....
Bed Plate	4 00	4 50	5 00	7 00	8 00
Spout and Cap	1 00	1 00	1 50	2 00	2 50
Pulley, each	2 00	2 50	3 00	4 00	4 00
Outside Bearing	1 00	1 25	1 25	2 00	2 50

Extras same as under Figs. 196 and 320.

FOR BELLS.—Fig. 206.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Bell only	$ 3 00	4 00	$5 00	$6 50	$8 50
Yoke	0 80	1 00	1 15	1 20	1 25
Standard	1 25	1 50	2 00	2 15	2 25
Clapper	0 50	0 50	0 75	0 75	0 75
Crank	0 10	0 15	0 15	0 20	0 20

FIGS. 207 AND 208.

	No. 6.	No. 6½.	No. 7.	No. 8.	No. 9.
Bell only	$14 00	$28 00	$35 00	$45 00	$95 00
Standards, each	1 50	2 00	2 50	5 00	7 00
Yoke	3 00	4 00	5 00	7 50	10 00
Wheel	2 00	2 50	2 75	4 75	6 00
Wood Frame only	3 00	3 50	3 50	5 00	8 00
Clapper	1 00	1 25	1 50	2 25	3 50
Jaw, with Flange	....	....	....	1 20	2 25
Jaw, with no Flange	....	....	....	1 00	2 75
Sheave	0 50	0 50	0 50	0 50	0 50